Telephony

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The I.C.C. Depreciation Formula and Its Effect Upon Independent Companies

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THE FOURTH and concluding article on the subject of the determination by regulatory commissions of the annual cost of depreciation of telephone property. The first and second articles of the series, under the title "The Long, Long Depreciation Trail" and reviewing the history of the movement to date, were published in "Telephony" of July 13 and July 20. The third article, under the same title as this one, appeared in "Telephony" last week

THERE ARE, in the plan for determining the annual cost of depreciation of telephone property, several important characteristics seriously affecting Independent telephone companies.

First, the plan arrives at what might be called an "average of property" by lumping together, so to speak, parts of telephone exchange property that are usually dissimilar in style, make, age and state of modernity; and this average, in the case of most Independent companies, is arrived at from a number of such units too few to obtain a practicable average.

If you place a number of apples, pears and plums in a basket and try to average them, any result reached will not be much of an average of anything at all. Even if you had only apples in the basket, your average would not be much of an average if you had only a few apples. Independent telephone companies have in most cases too few number of identical pieces of property to afford a practicable average, and when things that are not alike are averaged, you do not really have an average of anything.

Second, having arrived at such an "average of property," the plan applies to it a rate or percentage of annual depreciation, which rate is itself composed of an average of the past mixed with estimates of an unknown future.

Even if it were possible—which, of course, it is not—to tell in advance just when each of the thousands of different articles in a telephone plant will have to be retired because it is worn out, and what it will then cost to remove it from plant and what its salvage value will then be (all of which items must be known in order to accurately calculate the cost of depreciation of those articles) it would still be utterly impossible to calculate in advance the cost of the important elements of depreciation besides that of wear; namely, obsolescence and inadequacy.

These two elements have constituted in the past, according to engineers, the greater part of the cost of depreciation of telephone property.

OBSOLESCENCE arises from improvements in the art; every telephone company must reasonably keep pace with such improvements in order to furnish the grade of service the public demands and the commissions quite properly require. Such improvements necessitate, especially in normal times, that important parts of the plant be retired before they are worn out, to make way for more modern equipment.

These retirements must be charged off just the same as if the part retired had been used until it had worn out. It is plain, however, that no one can read the developments of the future with sufficient accuracy to tell in advance when any given part of a plant will have to be retired because it has become obsolete.

Inadequacy is, as the name implies, lack of facilities to provide the service required. It may be a lack of general facilities—such as a switchboard incapable of meeting the demands for service—or it may be a lack of facilities in some particular part of the plant, caused by a shift of population to some particular part of the exchange area served, such as a new residential subdivision.

Such shifts of population usually cause not only inadequate facilities in one part of the area served, but also facilities more than adequate

and, therefore, no longer needed in another part of the area.

It is a known fact that in normal times both business and residential areas of American cities and towns are constantly changing in character; it is likewise a known fact that no one can foresee, very long in advance, what the changes are going to be. But the telephone plant must change to meet them, whatever they are and whenever they occur.

The telephone property no longer needed in some areas, or inadequate to provide the service in other areas, is retired from service, to be replaced by property suitable for the service requirements. The loss in value of the property so retired must be charged off just the same as if it had been used until it had been worn out. This loss is a part of the cost of depreciation, but no one can possibly tell in advance what it is going to be or when or where it is going to occur.

The telephone man, therefore, who hazards an estimate of the future cost of depreciation must, to put it plainly, simply guess at the future cost of those major elements in depreciation cost—obsolescence and inadequacy.

As to these items, the past is no real guide for the future. The optimist will calculate the future one way; the pessimist, another. But it will be apparent that, since these two important elements must be taken into account, and since they cannot be accurately gauged in advance, no attempt to calculate in advance the cost of depreciation of a telephone plant can be expected to determine the real cost per year in the years to come.

THIRD, the plan, by applying strictly the "straight line" depreciation theory, requires that the estimated total depreciation cost of a telephone plant be charged off at the same rate every year. This arises from the fact that, under the straight-line theory, when the depreciation for 20 years, as an illustration, is calculated to be a certain amount in dollars and cents, it is required that exactly 1/20th of that amount be charged to operating expenses, as the cost of depreciation, for each of those 20 years.

Now, depreciation does not go on at the same rate every year. Even wear and deterioration are not the same every year, since they depend upon use and the elements, which are not the same every year. And certainly the two important factors of inadequacy and obsolescence are not the same every year. The depression has proved that.

A telephone company that has lost, say 25 per cent of its telephones, and still has its original plant available for serving its patrons, certainly does not need to make the same provision for inadequacy now that it needed to make when its plant was practically filled up and still growing rapidly.

Further, experience during the depression has shown that telephone companies in general have at least temporarily arrested the factor of obsolescence by the simple process of "making out" with what equipment they had. There is nothing surprising in this, since in "hard times" the public neither demands nor expects improvements in any art or service at the same rate as in prosperous times.

It is true that invention and development of the art have gone on during the depression, but all these new things did not go into actual service, and cannot do so until the operating companies have either the funds or the financing ability with which to buy and install them, plus reasonable assurance that business will be restored to a point making such installations advisable.

Anyone familiar with the matter will doubtless agree that all the elements of depreciation do not operate at the same rate every year, and that the cost of the very important factors of obsolescence and inadequacy rises or falls according to economic conditions. To this extent, therefore, the revenues of the telephone company are at least an indicator of the current cost of depreciation. That is to say, the same general economic causes that affect revenues also affect the current costs of at least obsolescence and inadequacy.

The straight-line theory, however, requires that the company reserve for depreciation substantially the same amount every year. This is not only impractical for a large number of companies; it is not in accordance with the facts of depreciation cost.

A far more practical method would be to allow the companies to make smaller provision for depreciation during the time their revenues are depleted from broad economic causes, which also temporarily arrest current costs of obsolescence and inadequacy, and require them to make larger provision for depreciation when revenues are restored and when the elements of obsolescence and inadequacy are again in full force.

This plan would be not only in accordance with the actuality of depreciation, but it would also protect from default on funded debt, and consequently from receivership or perhaps bankruptcy, some companies that simply cannot reserve from depleted revenues the amount currently required by the straight-line theory. Surely, strict observance of a theoretical formula is not sufficiently important to justify bankrupting an operating company.

FOURTH—and this is of importance, especially to Independent companies—the plan, as has been stated, does not arrive at the depreciation rate for any given telephone exchange (except, of course, in those comparatively few cases where class A and class B companies operate only one exchange), but it arrives at a *company-wide* rate.

Rates for telephone exchange service are generally made by exchanges, and not on a company-wide basis. It is not compatible either with the theory or the law of rate-making, as those things now exist, to make exchange rates on a company-wide basis. The result, when they are so made, is that subscribers at one exchange are charged more than is necessary for their service in order that subscribers at some other place may obtain their service for less than is necessary.

Both the subscribers and the company are entitled to have the telephone rates at a given exchange made on the basis of the property value, the operating cost, and the depreciation costs of that particular exchange.

But this plan proposes to use, in making exchange rates, not the depreciation cost of that particular exchange, but costs based on company-wide averages which could only by chance be the actual depreciation costs of that particular exchange. That in principle is as far from correct as if plant value, property taxes or even operators' wages for the company as a whole were averaged and such averages applied to that particular exchange in order to determine its rates for service.

THIS particular part of the plan is practical only when telephone exchange rates are made on a company-wide basis. *Any plan that does or tends to make rates for telephone exchange service on a company-wide basis, or to otherwise deal with separate telephone exchanges on a wholesale or standardized basis, is seriously inimical to the entire Independent telephone industry!*

The reason for this is simple: Such plans cannot work, without do-

ing serious harm to the telephone industry, unless telephone exchanges are owned in such large groups that the owning company can recoup at many of them the losses it sustains at many others—and Independent exchanges are not owned in sufficiently large groups to accomplish that.

Further, if standardization of rates for depreciation, for service and other things of the kind are good for any one group, they are better if they are made country-wide. This, when carried to finality, means that they are best if one company owns all the telephone exchanges in the country. It may be beside the point, but it seems pertinent to remark that this would probably mean that the government would soon thereafter own them all!

One point cannot be emphasized too strongly: The only proper unit for fixing rates for telephone exchange service, rates of depreciation, or any other item having to do with telephone exchange service, is the telephone exchange. Any plan that mixes in state-wide, company-wide or other costs or averages not based upon that exchange alone, is going to injure either the subscribers or the company at that exchange.

FIFTH, this plan of determining the amount a telephone company may charge to its operating expenses during any year for depreciation is dangerous to many Independent telephone companies, especially during times of depression, because, being based upon a fixed formula, *it takes away from the state commission the right such commissions now have to deal with each company on an individual basis.* That is, it not only takes away the discretion of the management of the telephone company as to the amount to be provided for depreciation in any given year—*it takes away the discretion of the commission as well!*

Everybody who knows anything at all about the telephone business knows that the depletion of revenue of many Independent telephone companies during the depression has put some of them in position where they simply could not, for some years past—and many of them cannot at present—make annual provision for depreciation at a rate that will, according to the best present knowledge of the cost of depreciation, cover the present annual cost.

There is no secret about that situation. The management of such companies knows it; the state commission with jurisdiction knows it. The situation is simply one that has arisen because of economic and other conditions beyond the control of the company, the commission or anyone else.

The state commissions recognize the circumstances surrounding such cases, and deal with such companies at present on a common-sense, individual basis. The commissions at present generally take a sensible and helpful attitude which comes to the point that if the management of the company is sincerely striving to serve the patrons satisfactorily, manage the company economically, and bring the business finally to a point where it can meet all its obligations, including that of adequate provision for depreciation over the whole service life of the property, the commission will do its part in helping work out the situation.

SUCCESS

Success means the developing to the highest possible point of efficiency of every talent that you possess, both latent and known. That is success.

It may not mean fame; it may not mean recognition by the world; it may not mean that you are going to attain to great things, or to great wealth; but you will attain to greatness of character, and that is the only asset, that is the only thing, that you take with you.—DR. A. E. STRATHGORDON, before The Executives' Club, Chicago.

The commissions are entirely within their legal rights in doing this. In doing it they are adopting a course that is constructive, helpful to both the public and the company; and that is in a broad sense a high justification for commission regulation, since it is both the spirit and intent of such regulation that commissions not only have but also exercise discretionary powers in dealing with the utilities they regulate.

CONSIDER, however, what happens if there is made effective a strict and ritualistic formula for the determination of annual depreciation costs. That means that the cost of depreciation can be determined by only one method, namely, that formula.

Not only has the discretionary power of the management been taken away from it with respect to depreciation, but *the commission has also given up its own discretionary power in that regard!* It can no longer deal with a company on an individual basis on the question of depreciation. If it does that, it admits the unworkability of the formula for that particular company; and if the formula is unworkable for that company, then who can tell for what companies it is workable, and when, how, and under what circumstances it becomes workable for any company?

If the formula is adopted by a commission it must apply without favor to all companies subject to the jurisdiction of that commission, of the class for which it is adopted. If some of those companies cannot live under it, that is just too bad!

Depreciation rates can be modified under the formula only when the facts show that the service life and salvage value of the depreciable property has been wrongly estimated—economic conditions and the financial ability of the company to meet the formula have nothing to do with it.

HAVING adopted the formula, the commission has given up its discretionary powers so far as the determination of depreciation is concerned; it has abdicated, on this highly important question, its power to do one of the principal things it was created to do—that is, to deal in a common-sense, practical and constructive manner with the problems of the utilities it was created to regulate. Of course, if the formula did actually determine the annual cost of depreciation of telephone property, and then allowed the application of that annual cost in a manner sufficiently flexible to meet the exigencies of the business and the times—all with the sensible view of providing from earnings the actual cost of depreciation over the actual service life of the plant—that would be something else again.

But the formula does not do that. It is merely another way of estimating the annual cost of depreciation. It arrives at, not the cost of, but merely an annual *allowance for* depreciation, reached by an elaborate, complicated and expensive method which, so far as anyone can know at present, may be no better, and in fact may be less accurate over the years, than methods far more simple.

It requires the company to make provision according to that formula every year, regardless of the company's ability to do so. It puts all the risk on the company because, if the allowance arrived at by the formula is too low, there is no way by which the company can be reimbursed for its consequent loss; if

too high, the commission having jurisdiction must necessarily lower it as promptly as possible.

A basic trouble with the whole proposition is that it arrives at what is admittedly an *estimate*; and then deals with that estimate—by making it the only amount the company is allowed for its annual cost of depreciation—exactly as though it were a *fact!*

THE cost of depreciation cannot be determined by any formula, because the future cannot be determined by formula, and the future is inextricably interwoven with the present and the past in all questions concerning depreciation. Like the whole proposition of making rates for telephone service—which is not and has never been an exact science—the question of depreciation is a practical question, which should be dealt with in a practical way.

The time to determine the amount a telephone company should be allowed for depreciation as a part of its cost of rendering telephone service is when the rates are fixed for the telephone service it renders at a given exchange; the depreciation determined should be the depreciation of that particular exchange; the authority to determine the allowance for that particular purpose should be the authority that fixes the rates for telephone service at that exchange.

At that time the past and the then existing facts about that exchange are known or can be determined by the commission—the value of the property, the past and present rate of revenue; the amount of the then depreciation reserve and, by actual observation, the then condition of the plant, both as to observed depreciation and its state of obsolescence and inadequacy.

The company's engineers give their opinion of the amount reasonably required for a reasonable time in the future to cover the company's loss from deterioration, obsolescence and inadequacy to the extent that they can then, by actual and practical observation, foresee them for that particular period.

Neither they nor the commission's engineers are required or expected to do the impossible thing of stating the actual cost of depreciation for such period, or even for the current year; they work frankly upon estimates based on professional experience, knowledge of the plant in question, existing and prospective economic and other conditions.

EVERYTHING else in a rate case, so far as the future is concerned, is also, and admittedly, more or less of an estimate. The amount of revenue that can be anticipated under the new rates is naturally an estimate; wages, cost of materials and supplies, taxes and other operating costs can never be foretold with accuracy in advance. In these circumstances it is nothing unusual that depreciation for the period should also be estimated.

The commission takes the known facts of the past and the estimates of the future, and does its best to promulgate a schedule of rates for service that will be fair and reasonable to the public and also compensatory to the company. But—and here is the point—neither the commission nor the company is tied down by this method to some exact formula for the determination of depreciation costs which deprives both of them of ordinary discretion in determining what such costs are!

In an important hearing before the Interstate Commerce Commission on this question, away back in 1923, a member of one of the principal state commissions made this statement:

"As we see it, the fixing of the rate of depreciation is, first of all, a managerial function. It is not a matter that the state commissions should go into in the first instance unless there is some evidence of improper judgment on the part of the management, any more than the purchase of a carload of coal should be viewed with suspicion merely because the management has undertaken the purchase.

It is a proper managerial function in the first instance, subject to review by public authority, and subject to review, in our view of the situation, by that authority which regulates the rates."

That was good sense in 1923; it is good sense now. The amount charged to expense on the books of a telephone company as its annual provision for depreciation should be determined by the management, which is obligated to the company's creditors and stockholders to show in the company's financial statements what the management believes to be the true condition of the business.

THE AMOUNT allowed the company by a commission in rate cases or in the determination of the propriety of dividends paid and so on, has no more place as such on the company's books than the amount the commission may estimate, in such cases, as the probable wage expense for the coming several years.

No commission ever fixes telephone rates on the basis of the company's books; it fixes rates upon its determination of the facts about the business—and it determines those facts from all sources available, inside or outside the books.

No formula that is promulgated by the Interstate Commerce Commission or any other regulatory body can ever determine the cost of depreciation with such accuracy that when the amount arrived at therefrom is used on the company's books, it will be final and conclusive.

Depreciation will still be a matter to be inquired into and determined in rate cases or other investigations of telephone earnings, just as it is now. No formula can take the question out of controversy in such cases—it can merely add to the controversy about it.

More than 15 years of endeavor to determine the cost of depreciation of telephone property by formula have proven that it cannot be done. The cost of, provision for or allowance for depreciation remains today, just as it has always been, a question that must necessarily be dealt with and settled from time to time as occasion or need therefor arises, and on the basis of practicality and common sense applied to the situation and to the known facts concerning it which exist at the time.

(*Concluded*)

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Mr. Telephone Manager, TELEPHONY Asks—

TELEPHONY's Editor wonders how many telephone managers showed the article and editorial in last week's issue concerning "Fire Insurance Credit for Farm Telephones" to their local newspaper and insurance men.

That was a matter of general news interest to all living in rural territory, and the kind of story the local newspaper likes to get. TELEPHONY's story, of course, was written for telephone men, but it gave information which the local newspaper man or telephone man could rewrite for publication.

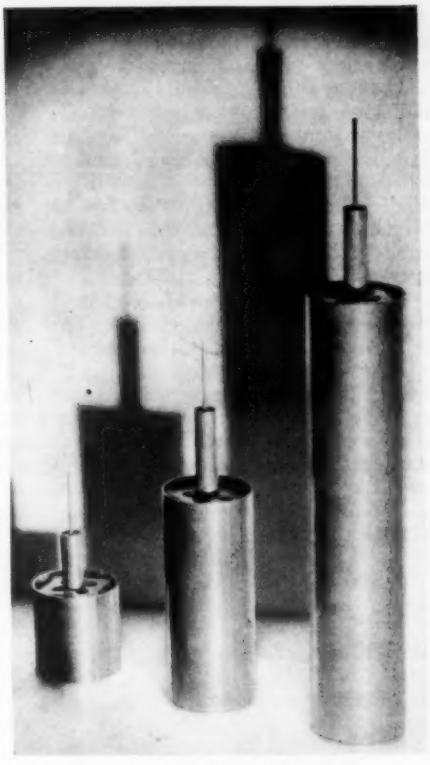
A suggested article, on this subject, for publication in local newspapers, is available upon application to TELEPHONY's Editor.

Recent Prices in the Metal Markets

New York, N. Y., August 12.—Copper—Quiet; electrolytic, spot and futures, 8.00c per lb.; export, 7.85@7.90c. Tin—weak; spot and nearby, 50.50c per lb.; futures, 48.70c. Iron—Quiet; No. 2, f. o. b. eastern Pennsylvania, $19.50 per ton; Buffalo, $18.50; Alabama, $14.50.

Coaxial Conductor Systems

By M. E. STRIEBY
Member, Technical Staff, Bell Telephone Laboratories, Inc.



Coaxial Conductors.

HERE IS a non-technical article concerning the coaxial cable to be used in the experimental circuit between New York and Philadelphia. More than 200 telephone conversations can be transmitted over this cable simultaneously. The cable will also be used for experimental television purposes. Tests under actual operating conditions will be made as soon as the coaxial cable installation has been completed

RESEARCH studies on carrier systems are aimed at making available more channels on each pair of wires. The present standard open-wire carrier systems transmit three telephone conversations in each direction on each pair of wires, a total of six channels occupying the frequency range up to about 30 kilocycles. If more channels are imposed on each pair of wires, and the upper frequency limit is raised correspondingly, interference and crosstalk become more and more serious problems.

The interference may be greatly decreased by placing the conductors within the lead sheath of a cable, and carrier systems applicable to existing cables—although not now in use—have been set up which will yield about 12 channels on each pair of conductors, and require frequencies up to about 60 kc. Although interference from outside the sheath is greatly reduced in cable circuits, crosstalk between the circuits within the cable sheath becomes more and more difficult to control as the channel frequency is raised.

In view of this situation, it appeared that a promising method of increasing the number of channels that could be carried by a single small physical structure, might be to employ a single circuit well-shielded from outside interference. A communication medium of this type would be suitable for frequencies as high as might be desired, because the protection provided against interference by a shield becomes better the higher the frequency.

An additional advantage of such a circuit is that only a single repeater is required for the entire group of channels, while with a cable, a separate repeater is required for each pair of conductors. Such a system could be provided by using two wires within a shield, or the shield itself could be employed as one of the conductors. The latter form has been termed a "coaxial conductor" circuit because of the physical arrangement of the wire within the shield.

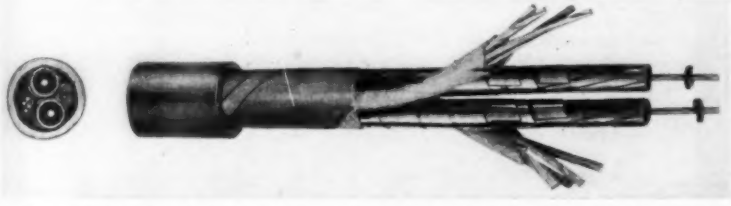


Fig. 1. Coaxial Cable Which is to be Used in the Experimental Circuit Between New York and Philadelphia.

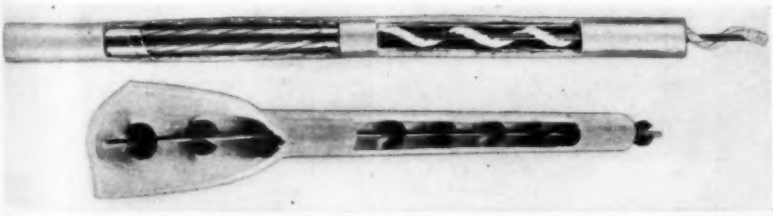


Fig. 2. Two Types of Western Electric Coaxial Conductor Which Have Proved Very Satisfactory Under Test.

STARTING as far back as 1920, preliminary consideration was given to the possibility of using a single line structure of the coaxial type for transmitting a frequency band extending up to something like a million cycles.

It was recognized that to accomplish this result it would be necessary to provide, on an economical basis, not only a transmission medium capable of handling such a wide frequency band, but interme-

diate repeaters capable of amplifying the band—preferably without splitting it up—and terminal apparatus capable of subdividing the band into individual telephone channels without excessive wastage of frequency space. It was realized later, moreover, that a band of the order of a million cycles in width would be required for the rendering of television of satisfactory definition.

Study of these problems led Lloyd Espenschied and H. A. Affel to the conclusion that such broad-band wire transmission could be developed in practical form with a coaxial structure as the line transmission medium. To obviate the unduly high attenuation that would result at the high frequencies from losses due to the insulation, it was proposed that the inner conductor be so supported within the outer one that the intervening dielectric would consist mostly of air.

The coaxial circuit is by no means new; it is, in fact, a classical form of circuit. Since the time of Lord Rayleigh in the middle of the last century, the transmission properties of coaxial circuits have interested mathematicians and physicists, probably because the circular symmetry of such circuits led to exact mathematical solutions for ideal conductors.

Coaxial lines had, of course, been used at low frequencies, particularly in the form of submarine cables, and the transmission theory of such cables had been investigated by John R. Carson. More recently a rigorous treatment of the problems met in the practical case of imperfect structures was obtained by S. A. Schelkunoff.

The coaxial structure had also been employed at radio frequencies as an antenna lead-in, and for this purpose had been designed to have largely air insulation to minimize high frequency losses.

None of these earlier applications, however, contemplated the use of the coaxial circuit in a broad-band overland line system, adaptable to the needs of multiplex telephony and television. Accordingly, a more comprehensive study of a complete coaxial system, including line, repeaters, and terminal apparatus, was undertaken by E. I. Green and engineers associated with him. Estimates were made of the comparative costs of telephone channels derived from such a wide-band system and obtained from other types of carrier systems, and of economical system design.

Fig. 5. K. C. Black With a High-Frequency Repeater Developed for Coaxial Circuits.

One of the first studies in connection with this development was to determine experimentally how nearly a physical coaxial circuit could be made to approach the theoretical performance. For this purpose a rather large coaxial line was selected, and about two miles of it installed under the direction of A. L. Richey at the test station near Phoenixville, Pa.

This line consisted of a copper tube about 2½ inches outside diameter, within which was mounted a smaller tube, which in turn contained a small copper wire. Two coaxial circuits were thus made available. Transmission measurements of various kinds were made, which showed that the performance of the line could be predicted theo-

Fig. 3. J. F. Wentz Making Experimental Coaxial Conductors on an Improvised Stranding Machine for Preliminary Tests.

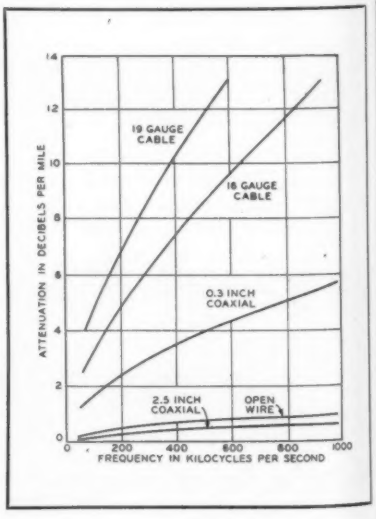


Fig. 4. Attentuation Characteristic of the Experimental 2.5-Inch Coaxial Conductor and the 0.3-Inch Commercial Types, Compared with That of Open Wire and Cable Circuits.

retically with remarkable accuracy.

After some progress had been made in the study of the combined line and amplifier system, it seemed most likely that an even smaller structure would prove to be most satisfactory for the objective in view. Because of the problems of installation, the most desirable form of conductor was something that could be rolled up on drums, hung on poles, and handled after the fashion of telephone cables.

A wide variety of hand-made samples were experimented with in a search for a suitable structure. An experimental machine was set up by J. F. Wentz in the basement of the laboratories and used by him to produce sufficient lengths of conductor for preliminary tests. Results obtained from these samples were so satisfactory that the development of structural designs was carried forward by G. A. Anderegg, W. E. Mougey, and others, and various cables were produced by the Western Electric Co., and used for tests in the factory and field. Two types are shown in Fig. 2.

THE ATTENUATION characteristics of these coaxial conductors as compared to those of open-wire lines and cables are shown in Fig. 4. At frequencies of the order of a million cycles, the attenuation of the 0.3-inch coaxial lines is such that repeaters are required at intervals of perhaps ten miles or even less. Such frequent use of repeaters would be impracticable were it not for the fact that the repeaters promise to be relatively inexpensive.

As now contemplated, a repeater station might consist of a box hung on a pole or placed in a manhole in much the same manner as loading pots are installed. This means, of course, that the repeater must be fully automatic—requiring attention only at infrequent intervals. Power required to operate it will be transmitted at 60 cycles over the coaxial line itself. A single repeater amplifies the entire frequency band.

The attenuation of copper-wire lines always varies with temperature—overhead lines being perhaps 10 per cent higher than average on the hottest day in summer and 10 per cent below average on the coldest day in winter. On a transcontinental coaxial circuit, this variation would reach tremendous proportions. Even on a circuit from New York to Philadelphia, the variation would be sufficient to make conversation impossible unless the transmission were regulated in some manner. Since most of these repeater stations would be unattended, their regulation must be automatic.

VARIOUS experimental repeaters have been built for frequencies as high as five million cycles. To obtain the necessary gain at these high frequencies, the tube development laboratory group was called upon for assistance and has produced many new and useful tubes. Due to the large number of repeaters, each carrying a large number of channels, the principle of feedback developed by H. S. Black was employed to obtain high stability of gain and freedom from distortion.

Various circuit arrangements have been tried out in the laboratory for frequency ranges up to as high as 5,000 kilocycles. One such repeater, devised by K. C. Black for the frequency range of 100 to 1,000 kilocycles, is shown in Fig. 5. It is expected to provide amplification and automatic regulation within a few tenths of a db over the entire frequency band for a temperature range of 120 degrees Fahrenheit.

The regulation will be secured with the aid of a one-million-cycle signal transmitted over the line and used at each regulator repeater to control the gain characteristic. An experimental repeater with power supply and automatic regulation is shown under test in Fig. 6.

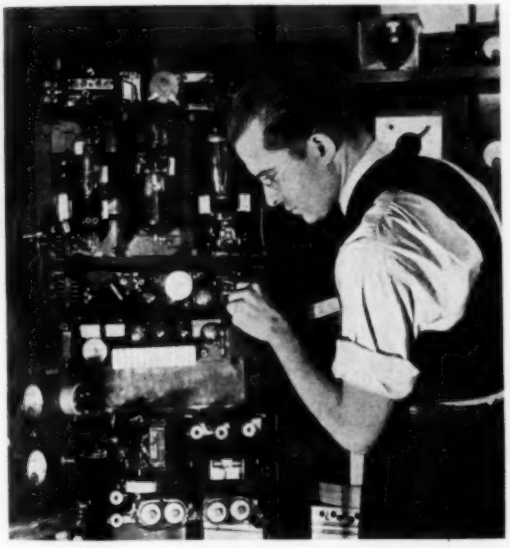


Fig. 6. R. R. Blair With Experimental Repeater and Automatic Control Circuits.

Fig. 7. C. L. Weis With a Group Modulator for Use in a Million-Cycle Terminal.

A million-cycle coaxial line would carry more than 200 voice channels. At the sending end of the line, conversations from 200 telephone lines must be gathered together and placed on the single coaxial line; and at the receiving end these 200 conversations must be separated and sent out over 200 different circuits.

The development of modulating and selecting apparatus to perform this function at the two ends of the line was a considerable undertaking, but has resulted in satisfactory working models for thousand-kilocycle systems, and even for systems of considerably higher frequency.

As with other carrier systems, each voice-frequency channel at the sending end is modulated and so moved up in frequency for trans-

mission along the line as a high-frequency side-band. For the coaxial system, however, more than one step of modulation is employed. In the first step, 12 voice-frequency channels are moved up to positions one above another so that they occupy the frequency range from 60 to 108 kilocycles—thus allowing four kilocycles for each channel.

In a million-cycle system, 20 such groups would be used, 19 of them modulated a second time and raised to successive positions one above another—giving a top frequency of 1,020 kilocycles. A group modulator for this second step is shown in Fig. 7.

MODULATING and filtering circuits for such a complicated terminal have already been devised and tested in the laboratory. For selecting individual channels, quartz crystal filters are employed. For selecting groups of channels, filters have been provided to pass a band 48 kilocycles in width, thus including 12 speech channels.

Terminals designed to provide for a five-million cycle system and handling over a thousand channels have also been studied. Three steps of modulation would be employed. Experimental apparatus developed by A. G. Jensen for such a terminal is shown in Fig. 8.

The coaxial line is also well adapted for transmitting over long distances the extremely broad frequency bands required for television. Since the frequency range for high-grade television extends from the neighborhood of zero up to a million or more cycles, special modulating apparatus is required at terminals to lift the entire band to a range which can be transmitted over a coaxial system.

The introduction of carrier telephony some 15 years ago was a tremendous step in the extension of the frequency range employed for transmission purposes. The development of fine-wire long-distance repeater cables decreased the cost of facilities but retained the transmission of voice frequencies.

More recent developments of carrier on cable aim at the extension of frequency range to be transmitted over these long distance cables. The development of coaxial systems opens a further vista of still wider frequency ranges.

Fig. 8. A. G. Jensen With High-Frequency Terminal Apparatus and Coaxial Wiring.

• • •

Total Output of Treated Poles in 1934

Government statistics on the quantity of wood treated in 1934 compiled by R. K. Helphenstine, Jr., of the U. S. Forest Service, Washington, D. C., in cooperation with the American Wood-Preservers' Association, and just released, show a 51 per cent increase in 1934 over the number of poles treated in 1933.

The total quantity reported was 2,579,712, compared with 1,711,411 poles the previous year. There has been a gradual increase in the number of poles given a full-length pressure treatment from 47.3 per cent during the peak year, 1929, to 73.2 per cent in 1934.

Of the poles treated, Southern pine poles ranked first, with a total of 1,770,884 poles, or 68 per cent of the total. This is an increase of 703,030, or 66 per cent, over the 1,067,854 pine poles treated during 1933. Western red cedar poles ranked second, with a total of 426,375, and northern white cedar ranked third with 184,407.

Of the total number of poles reported treated during 1934, 1,889,271 received full-length pressure treatment and 690,441 were butt treated. Statistics show that 99 per cent of the poles were treated with coal-tar creosote.

• • •

James E. Warren Elected Head of Southern Bell

On August 12 James E. Warren, of Atlanta, Ga., vice-president of the Southern Bell Telephone & Telegraph Co., was elected president of the company succeeding Ben S. Read, who died on July 23. His election places him in charge of the company's business in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee.

Mr. Warren had been vice-president in charge of operations with offices in Atlanta since May, 1930.

• • •

Company's Little Park Adds to Joy of Life

The Orange County Telephone Co., Middletown, N. Y., recently made an improvement in its grounds that has incited admiring comment.

A couple of years ago an old cottage next to the telephone building was torn down, and the cellar left open. The Orange County company filled the cellar and leveled the lot. Then it did some planting and today this is one of the most attractive spots in town.

"We don't know whether Charles C. Chappell, Frank Fancher, Ed. Davenport, John Ayers, Wes Osborn or some rank outsider planned the charming little park beside the Orange County Telephone Co. building on John street, but one thing is certain, whoever did made a good job," remarked a local newspaper columnist as he took a seat near the fountain in the park. "If it was Mr. Chappell it should get him a lot of votes in case he wins the nomination for mayor."

After commenting on the flowering shrub known as the yucca or filimentosa or Spanish bayonet, the columnist continued, in quoting a local authority on plants and flowers: "And Mr. Cox suggested that if we all would follow the telephone company's example and try to brighten our lives as the telephone company has brightened the corner it occupies, this would be a much pleasanter world. We seconded the motion."

A Thought-Provoking Letter

THE PRACTICE of "passing the buck," or "let George do it," is an old, old game and, generally speaking, is to be condemned. However, there are times when it may have merit.

TELEPHONY received a letter from a subscriber the other day that discussed the importance of diversifying and increasing the use of telephone facilities. This question has received a great deal of attention and deserves a great deal more until a more extended utilization of telephone plants is a reality.

WE COMMEND the matter to telephone associations and the operating companies and, to that extent, are "passing the buck" to them for action. Our subscriber's letter presents the matter effectively and it is given in full:

EDITOR TELEPHONY:

Last evening, after having watered the lawn and given a bit of attention to the flower beds, I eased into a lawn chair and let my eyes and my mind wander about a bit. My gaze shortly fell upon four wires entering my house through the rear wall, and my mind quickly picked them up and followed them in both directions.

Outwardly one pair of these wires makes a sweep to a pole in the alley where the wires are connected to a good sized transformer. The other pair also swings over to a pole connection and, after traversing a few rings, enters a box; and I know that there these wires are connected to a pair of wires in a cable and continue as an individual pair to the central telephone office quite a distance away.

APPARENTLY there is quite a difference in my individual allotment of wire plant for the two services. But the questions that popped into my head were: What do these two services mean to me and my family? What do we get out of them?

And the answers—let's first take the pair of large wires that runs down to the fuse cabinet and thence branches out all over the house. Let's see: they supply our lighting, do our cleaning and dusting, give us refrigeration, do the washing and ironing, tend the furnace in cold weather, make our toast and coffee in the morning and fan our heated brows in the evening.

They run the sewing machine, mix and chill our drinks and custards, keep the radio booming, run the clock, ring the door bell, shave Dad's face and curl the lassies' hair, warm baby's food and throw a breeze of warm or cool air over her crib, and give Mother a nice warm pad for her back for the lumbago or what have you. That's not all, but it is enough.

The other pair of wires that ducks down beneath the floor and comes up to the telephone, what about them? Oh, those wires are for conversation. You can talk over them. You can talk to almost any one in the world.

Yes, but how much time does one put in talking and what else can I get out of these wires that I have exclusive use of clear back to the central office? Personally, I could not think of another thing.

BEING of an inquisitive nature, and fearing that I might be missing something, I got up, lit my pipe and wandered over to talk to my old friend Blank, who lives nearby and who has spent nearly a lifetime in the telephone business.

I found him alone on his side porch, enjoying a cooling drink. After he had mixed me one, I asked him, pointing to the telephone wires: "What else besides conversation can one get out of those wires?"

His reply: "Oh, I get a good living out of them; you get nothing but conversation. Why?"

"Oh, I'm not kicking about not getting my money's worth out of the service but really it seems a waste not to use the wires for something or other worthwhile during the 22 or 23 hours of the day when no one is telephoning. I think both the telephone company and myself could and should get more out of that expensive wire plant, if some other services were made available at a small charge.

"Has nothing of the sort ever been considered? Is the telephone company asleep?"

MY FRIEND then told me that I had by no means overstated the case; that, in addition to the idle time of station-connected wire, there is in every cable a liberal percentage of dead wires held in reserve for possible need and that such wires should really be earning their keep.

He further related that a number of extra services had been proposed and worked out for supplying over telephone lines and without interference with telephone service—such conveniences as automatic burglar and fire alarms, patrolman's reporting service from the exterior of buildings, musical program distribution, time-of-day announcements, etc., for the individual subscribers; and for the general public or municipality, over the extra wires, modern fire and police alarm and signaling systems, taxicab call systems and other leased wire systems.

To my query, "Wouldn't it pay to start something moving toward more efficient use of these splendid wire plants?" he said: "You try, I'm tired." And to my question, "What can *I* do?" his answer was: "Well, if you are really interested, you might try writing a letter to TELEPHONY."

So here it is. What do you think?

The Operators' Corner

By MRS. MAYME WORKMAN
Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

METHOD of handling "Indefinite Address" long distance telephone calls. Series No. 206

OCCASIONALLY a calling party is unable to furnish a definite address where the called party may be reached, in placing long distance calls. Such calls are termed "Indefinite Address Calls."

When a call of this kind is received, a complete record of the call must be passed to the terminating toll center TX. The TX will enter as many as possible of the details in the proper spaces on an "IN" ticket. As soon as the TTC TX operator is sure she has understood all of the details she will say, for example, "This is operator 30," and will continue to hold the toll circuit. As an overlapping operation, she will enter "recd (time)" in the space for reports and will enter her personal number in the "Operator" space.

The TTC TX, having recorded an "IN" ticket, is responsible for obtaining a report concerning the called party. Each of the called stations should be reached in turn if necessary. When the called station answers, the call is announced immediately, giving name of calling place.

All reports obtained are entered on the back of the ticket and any significant reports are passed to the OTC operator. The toll circuit is then released immediately unless you are ready or unless you require further directions. If the called party is located at any one telephone even though he is not immediately available, only the subsequent attempt time for the report obtained at this telephone should be entered on the ticket.

If the called party is not located at any of the telephones tried, enter the subsequent attempt time for the first report obtained. If routing directions are necessary, they should be secured and entered before filing the ticket.

If a call is received, for example, for W. R. Gordon, in care of principal hotels, the TTC TX should obtain the numbers of the principal hotels from the local information operator in the usual way, and enter them, encircled, in the called "Telephone Number" space. She should then reach the first called station and when the called station answers announce the call, saying, for example: "Mr. W. R. Gordon, please? Peoria is calling."

If the hotel operator reports that Mr. Gordon is not registered, say, "Please page Mr. W. R. Gordon and notify him to call long distance operator 30," and enter on the ticket in the space for reports "*nrg* (Grand Hotel) (time)." Release the first called line, secure the second called line and then the third, etc.

It is not necessary to AG an "Indefinite Address" call every 15 minutes after word has been left for the called party. The subsequent attempt time is determined in accordance with the reports received at the various stations.

The TTC TX is responsible for obtaining reports and passing any significant reports to the OTC operator.

Questions from Illinois Operators

1. What is the correct phrase to use when leaving an "All-trunks' busy" call order?
2. Must an operator say, "Thank, you" when receiving a long distance call?
3. What report should an operator give when a messenger returns and says, "Notified personally—no reply"?
4. Is it necessary to "AG" every 15 minutes on a "ticket locate" after having called all business places and "LW"?
5. Can a "Report Charge" be reversed to the party refusing to accept the charge?

The answers to these traffic questions are presented on page 22.

• • •

Street List in New Classified Directory

A ready reference guide to Chicago streets is a new feature included in the August issue of the Chicago classified directory, distribution of which began August 12.

The list of streets, arranged alphabetically on pages 4 and 5 of the directory, will undoubtedly prove valuable and convenient to telephone subscribers. By referring to the guide it is possible to tell quickly in what direction a given street runs, and how far east or west of State street, or north or south of Madison street, it is located. (State and Madison streets are the base lines from which all numbers start.)

The guide does not include streets which have numbers for names, such as 47th street. All such streets run east and west, and are located south of Madison street, and the name of each indicates its location.

Each listing of an important street, which runs diagonally or irregularly to base lines, shows its location at the nearest point from the base line, where the street begins, and also its extremity. For example, the listing for Lincoln avenue, a diagonal street, shows that it is located between 300 West at 1900 North, where it begins, and 3600 West at 6400 North, the city limit.

Inclusion of the street list is expected to increase usage of the classified directory by the public. The preliminary pages of the directory also include a list of points of interest in Chicago, and postal rate information as well as a full page map of the city and suburbs, featuring the state and federal highways.

Employes of the West Iowa Telephone Co. and Some Members of Their Families, Totaling 48 Persons, Assembled at an Outing in the Park at Cherokee, Iowa, July 30. Swimming was a Main Attraction and a Basket Supper was Enjoyed after a Strenuous But Happy Day of 100-Degree Weather.

Here and There
In the Telephone Field

Indiana's "Queen of Golf" a Telephone Operator

Miss Elizabeth Dunn, night operator in the Lincoln office of the Indiana Bell Telephone Co. in Indianapolis, still retains her right to the title of Indiana's "Queen of Golf." She recently won the Indianapolis women's golf championship for the tenth consecutive year. Then on July 26 Miss Dunn defeated Harriett Randall, Indianapolis, three up and two to play, to win the 14th championship meeting of the Indiana Women's Golf Association at Fort Wayne.

This triumph brought Miss Dunn her sixth state title in ten years of competition, and her third in succession. Her winning years have been 1926, 1927, 1931, 1933, 1934, and 1935.

By winning the title three years in succession, "Queen Elizabeth" gained permanent posession of the platinum, diamond-studded pin, emblematic of the championship.

• • •

Armchair, Ozarkiana,
August 10, 1935.

TELEPHONY PUBLISHING CORP.,
Chicago, Ill.

Dear Mr. Telephony:

My husband, Mr. Schrooch, ast me to write and explain this uneak picture which you will now examine and which was drawn from life by our son Beacon.

Please notice that the lispful woman who is looking languidly and longingly leftward at the large lovely woman on the left, is Amelia Earhorn, chief night switch. "Meely" has spent some 42 year as a rural plug-pusher and 8 year as co-respondent for transient newspaper editors.

The buxom woman examining Miss Earhorn through the spy glass is Mrs. Oneida Hammerstadt of Saint Louie, Mo. She came out from the city three weeks ago today, bringing along her husband while she bought one of Ed's (my husband) select, $5 per acre, mountain-loam, cenery, fishing and bull frog farms close to Armchair. Mr. Schrooch says the Hammerstadts expect to make farming their life's calling since they can't find anything else in the city which is as remoneyrative as mountain agriculture.

My husband sure does know how to sell farms to these city folks, specially when they've got enough cash left to pay him his commission after settling up for the gas and oil which they use up in looking around. Ed's strong point in closing is always the cenery and fishing.

Oneida was next door today looking at a cow to put on her farm. Our son Beacon will, without a doubt, be out there hanging around with Ed's new Flexa Flip camera when she starts squatting for her first milking lesson. If it's a constructive pickture I may send you a copy but for goodness sake don't go and put it in the paper for she'll be sure to see it.

I have hardly mentioned anything yet which might benefit your readers so at this point, with sketch in hand, I must remind you that the housing, in which you see "Meely's and Oneida's" portrait, is all made out of tellafone parts. The curved black pieces are from a ground rod which was drove in some 28 year ago or sooner. Beacon, our son, reclaimed this rod with his new and improved ground rod pulling forcep and hammer which you published a spell or two back.

When this rod was pulled up, my husband, Mr. Schrooch, noticed that it was still bright on one end after all these years, and so took it away from Beacon for a labertory test. They found the name "Armco" on the bottom end and then Ed remembered a man by that name who was around Armchair about 30 years ago peddling galvanized rods to farmers for their lightning grounds. We bought two of these off of him at the time for test purposes and this is one of them. We would like to buy some more of these and, if you know where he is living now, please have him call on us soon.

Pen Sketch of Photographic Easel Made From a Well-Galvanized Ground Rod Taken From the Earth After 28 Years of Service.

Since the rod just mentioned is rather anteak Beacon designed the idee of making a souveneer for our central office dresser. The bolts, button and brace seen herewith were given to my husband as a present from Aleck Graham Bell over 40 year ago. I can't quite remember but I think Ed said that he was employed by the Uneada Bisket Company, but he was a very near and dear friend.

I don't know whether my husband loaned him any money or not. Ed's not very selfish when it comes to loaning money, tools etc., I suppose that's why we're so pore. I'm not that way, I believe in labeling everything you loan so that folks will remember it is not their own and recognize it as such when you go after it. Loaning things is proper and right but don't overdo it or you'll spoil your contemperaries.

Since the subject of galvanized furniture is now up I'll tell you about a batch of "elecktroed" braces and bolts Mr. Hatch of the Dunkhill exchange purchased off of the Hooker Bolt & Nut Company of Skinnerville. They lasted just five year. I wish you would try and find out where Mr. Armco stays and have him get in touch with us as we are going to build a new toll line to Rubberton soon and want some real hardware which will stand the corrosive atmosfear which goes over our lines.

Since space is too limited I can't think of much else to say except that if you want to place any orders for anteak easels and fotos please put yourself in touch at once with The Gumville Mfg. Co. or The "Zip" Advertis-

ing Co., both of Armchair, Ozarkiana. Their manager has rented our printing press and is here now working on his new catalogue.

My husband was over to Bumpton the latter part of last week and got some subscriptions to TELEPHONY, which I suppose he has mailed you ere this. With our most extream desire four your success we beg to remain,

Respectively yours,
GUMVILLE TELO EXCH & MFG CO.,
By Emily (Harper) Schrooch,
General Manager.

MOTTO: "If life is what we make it, then let us always buy "Sure Enough" galvanized hardware for our poles from this day on."

• • •

Smoking Around Exchange Can Be Stopped

In TELEPHONY of August 10, page 23, Ray Blain ventures the question as to how to abate the cigaret nuisance around exchange buildings and asks why it is that men are so careless with their fireworks while so busily engaged in their duties therein.

Employes are careless because this is not called to their attention frequently. I heartily agree with Mr. Blain that the reforming business is not very satisfactory. Most men have a pet habit that they would hate to part with and the majority of them consider that it is no one's business but their own. This may or may not be correct, but let us consider the hazard from the angle he has suggested.

I well remember a very small boy who, one Fourth of July, thoughtlessly left a piece of burning punk, with which he was lighting his fireworks, on the kitchen stove. Later when his mother came home, his attention was called to the fact that someone had burned a long streak in her new linoleum. Of course, no one knew anything about it.

That little boy (who happened to be the writer) received prompt instruction that celebrations where fireworks were involved belonged strictly out of doors. So far as I know, there was never any more punk burning in mother's kitchen.

Telephone exchanges can be as neat as the day when visitors are welcomed in to inspect the new central office, provided someone with the ability to exercise authority (like my mother in her kitchen) is placed at the wheel.

I have installed and helped to install a good many switchboards in my time and some 15 years were spent behind a soldering iron, inhaling the fumes from Kester's hot resin core solder and those from the many brands of cigarets I had in my collection. The latter, I thought, eased the pain of work.

I am not entering into a preachment nor a debate on the harmfulness of the cigaret but am discussing smoking from the angle of economy in its use. From my own personal viewpoint, it is a time waster, a money waster, an efficiency waster, a health hazard and a fire hazard.

I shall only touch upon the first point mentioned, which many users of the weed will perhaps consider far-fetched. Supposing that in a large exchange 50 per cent of the employes smoke. Since the general manager sees no harm in the habit, he generously provides a centrally-located smoking room, giving employes who smoke opportunity to visit the smoker during work hours. A careful check will reveal the fact that the smokers are consuming more time for their pleasure than the non-smokers.

A man cannot stop and light a cigaret while playing first fiddle in an orchestra, as he would no doubt leave a lot of notes out of the number which ought to be in it. A first-position operator cannot climb down from her perch and visit the smoking room for a "drag" 20 or 30 times a day for the same reason.

For anyone who sees no harm in smoking and does not want his employes who smoke to be miserable while on duty, let him very thoughtfully provide a steel-lined, steel-equipped smoking room on the exchange premises and appoint scheduled smoking times for all.

If you have never smoked, Mr. Blain, and will at once take up this apparently very pleasurable habit and persistently keep at it for 20 years, you will then be in a position to know why switchboard installers grow careless in leaving their half-burned fags all around during a cut-over.

There is a solution to the problem, but it is not in the plan just outlined. I smoked cigarets a long time but I quit because they were lowering my efficiency. I had the habit as bad as any of your modernists, yet never once did I have an exchange manager ask me not to smoke on the job. He would have been doing me a great favor if he had done so, and I would have respected him for it.

It takes just the same amount of courage these days to harness this exchange nuisance you have mentioned as it did in the days of long ago, but a little tact and firmness will solve it now as then.

In working for a man some time after I had quit smoking, I called his attention one day to his early morning pipe-smoking janitor—how easy it would have been for him to set fire to the building. "NO SMOKING" signs were immediately put all around, and I am safe in saying that not one of this man's employes, and there were many in the building, ventured to openly disobey the state fire marshal's injunction. This man called the worst offenders to his office and told them why the signs were put up. His own superintendent tried smoking on the job later and the men took him to task for it.

Smoking in the telephone exchange can be stopped if the management wishes to do so—just as my mother put a stop to the burning of punk in her kitchen.

OLNEY, ILL. FRANK L. WHITAKER.

Answers to the Traffic Questions on Page 16

1. Say, for example: "Call operator 20 at Mattoon, Ina 23, all trunks busy. I will hold this circuit."
2. No. As soon as you have sufficient information to advance the call, say, "Will you hold the line, please?" and proceed with the call.
3. A "PN" report. ("On Mr. Smith's call to Decatur, Mr. Hill has been notified to come to the telephone but has not yet called. I will call you.")
4. Refer to the introduction to these questions and answers.
5. If you receive a request to reverse a report charge on a call, accept the request, making no exception to this rule even if the called station has previously refused to agree to the reversal of the message charge.

• • •

Flashes and Plugs—News Briefs and Comments

Chicago papers say the telephone operators in the county offices have to work harder than those in the city hall, and are paid lower salaries.

* * *

There are so many different government bureaus in Washington that their telephone calls often go astray. The Bureau of Indian Affairs has no such trouble, however, as the response is always: "Good morning, Indians."

* * *

One hundred years ago this month—August 2, 1885—Elisha Gray, who claimed equal honors with Alexander Graham Bell as the inventor of the telephone, was born in Ohio.

* * *

Hollywood and Beverly Hills, where the movie stars live, average 300 long distance telephone calls of over 2,000 miles every 24 hours. They like to "call up' London and Paris.

FROM RAY-O-VAC FILES:

"We now have Ray-O-Vac No. 9451 Transmitter Batteries in service in fourteen exchanges, and contemplate placing them in all of our remaining exchanges very shortly.

"Results are very satisfactory and we not only have had favorable comments regarding these batteries from operators and linemen but also from subscribers.

"At two points where we have rebuilt toll lines, Ray-O-Vac Transmitter Batteries have carried over the toll lines any conversation taking place in the operating room, regardless of the distance this conversation was from the operator's transmitter."

(The original of this letter may be seen at the Ray-O-Vac offices)

RAY-O-VAC

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(Formerly French Battery Company)

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Discusses the entire industry!

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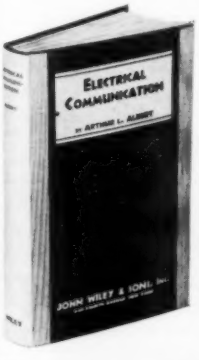
By ARTHUR L. ALBERT

Associate Professor of Communication Engineering, Oregon State College

A study of the various specialized phases of electrical communication as related to the usages of modern communication systems. This book presents not only theory but a discussion of the entire industry. Although not highly mathematical, the treatment is exact, up-to-date, and in accord with the highest engineering standards. The communication engineer will find this book a valuable addition to his working reference library.



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Obituaries of Telephone Men

J. E. HORSMAN, for many years secretary and general manager of the Barron County Telephone Co., Rice Lake, Wis., and for several terms vice-president of the Wisconsin State Telephone Association, passed away at his home in that city on July 13. Mr. Horsman would have rounded out his 74th year had he lived only a few weeks longer, August 5, 1861, marking the date of his birth. He had been in ill health for several years.

A resident of Rice Lake for 55 years, moving to that city from Guelph, Ont., Can., his birthplace, Mr. Horsman had been active in telephone affairs since he helped to organize the Barron County company in 1896. In 1900 he became a stockholder of the company; in 1904 he was made local manager of the Rice Lake exchange; in 1922 he was elected secretary and general manager of the company.

His company has for years been one of the best managed of the smaller telephone properties in the country. Much credit is due him for the building of the modern and commodious exchange in Rice Lake, in 1930, at which time that city was made a primary long distance center in the state for the Wisconsin Telephone Co.

In 1926 Mr. Horsman was elected vice-president of the Wisconsin State Telephone Association, to which office he was re-elected for two successive terms. He earned the reputation of being one of that organization's most dependable workers.

Mr. Horsman took an active interest in the affairs of the First National Bank, of Rice Lake, of which he was vice-president. He is said to have contributed generously in time and money to every good cause for the upbuilding of his community.

In his earlier years Mr. Horsman traveled in western Wisconsin for the C. W. Hackett Hardware Co. of St. Paul, and became widely known. He also traveled for many years for Marshal Wells Co., of Duluth.

Mr. Horsman helped organize the Rice Lake, Dallas & Menomonie Railroad, later sold to the Soo Line and known as the Blueberry line. Another project receiving substantial support from Mr. Horsman was the new Land o' Lakes Hotel, in which he was one of the largest stockholders.

J. E. HORSMAN, Secretary and General Manager of the Barron County Telephone Co., Rice Lake, Wis., and Active for Many Years in Affairs of the Wisconsin State Telephone Association, Died Last Month at the Age of 73.

In a civic way Mr. Horsman was active years ago in local commercial clubs. He was a member of the city council and also of the board of education at various times. During the second Cleveland administration he served as postmaster and was prominent for years in Democratic circles. He was a member of various Masonic orders.

Mr. Horsman was united in marriage June 1, 1886, with Miss Ruth Holbrook, of Rice Lake, who passed away five years ago. To this union was born one daughter, Miss Grace, of Rice Lake, who survives him.

▲

ARTHUR EDWARD VAN HAGEN, special agent for the American Telephone & Telegraph Co., in Washington, D. C., since July, 1932, in connection with Federal Communication Commission matters, passed away June 29 at the Wardman Park Hotel, after two days' illness following a heart attack. Mr. Van Hagen was 50 years old.

A native of Kansas City, Mo., Mr. Van Hagen was reared in Chicago. In 1906, upon graduating from the school of engineering of the University of Wisconsin, at Madison, he secured employment with the Illinois Bell Telephone Co. in Chicago. He later became associated with the Michigan Bell Telephone Co., with headquarters in Detroit. Subsequently he was transferred to the

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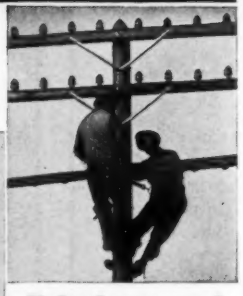
Indiana Steel & Wire Company
Muncie, Indiana



Telephone and Telegraph Wire
• • •
Steel Strand

traffic engineering office of the American Telephone & Telegraph Co. in New York City.

Mr. Van Hagen directed the installation of automatic telephone equipment in the cities of Richmond, Va.; Dallas, Texas; Charleston, W. Va., and Washington, D. C. For the past three years he was stationed in the capital city as special agent for the A. T. & T. Co.

Surviving Mr. Van Hagen are his wife, formerly Miss Lydia Begole, of Denver, Colo., whom he married in 1921; two brothers, L. F. Van Hagen, of Madison, Wis., and Homer H. Van Hagen, of Buffalo, N. Y., and one sister, Mrs. Elmer G. Johnson, of San Diego, Calif.

▲

J. L. YOUNG, 62, owner of the Garwood (Texas) Telephone Exchange, prominent and well known citizen of Garwood, died in Columbus on July 23 from injuries received in a highway accident the same date.

He was making repairs to the telephone line near Vox Populi, a few miles west of Garwood, on Highway 71.

When Mr. Young stepped around his parked car to pick up a wire, extending from a high pole across the highway, he was struck by the trailer on a passing truck. He died about 30 minutes after being taken to the physician's office.

Mr. Young moved to Garwood seven years ago from Oklahoma, and had been prominently connected with Garwood's business and social life since that time.

He is survived by his widow and his mother, Mrs. H. D. Young, who recently passed her 95th birthday, two sons and seven daughters.

▲

ASA READING, of Flemington, N. J., a pioneer in telephone work in that section of New Jersey, died on June 5 at the age of nearly 68 years. Death was the result of a general breakdown in health following a heart attack last December. He failed to rally after an operation was performed, amputating his right leg.

Mr. Reading was born at Pittstown. He later moved to Flemington Junction where, with Hiram E. Deats he became interested in electrical experimentation. They, with other young people of the community, developed a local telegraph company and later Mr. Reading established a telephone company which he operated on a commercial scale for more than 20 years. This company, known as the Reading Telephone Co., Mr. Reading sold in 1922 to the New Jersey Telephone Co., which now operates the system. For a number of years he remained in the employ of this company.

Early in his career Mr. Reading was

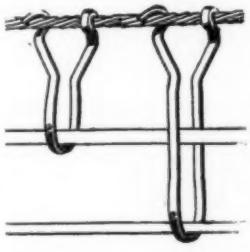
(*Please turn to page* 34)

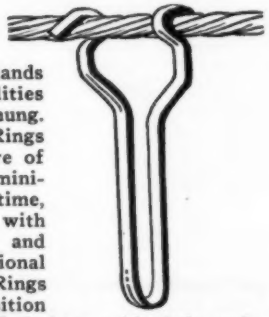
HANG THE CABLE *with* "NATIONALS" *for Speed, Security, Economy*

REGULAR RING

National Rings are designed to deliver maximum service and efficiency in the hanging of cable—The "Tension Grip" assures that once placed on the strand they will not jump off or slip; this eliminates the necessity of reriding to respace and replace and enables you to pull cable either way—National Rings are smooth galvanized by a special process so that their use means a minimum of cable cutting—and your crews will place them with greatest ease and speed.

EXTRA LONG RINGS

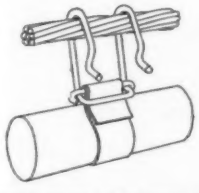


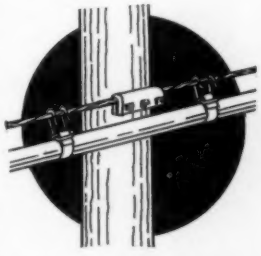


Many times service demands increased cable facilities where cables are now hung. National Extra Long Rings are designed to take care of these emergencies at a minimum expenditure of time, material and labor, for with them you can easily and quickly hang the additional cable on the existing strand—These Extra Long Rings have the same tightness of grip and rigidity of position on the strand as National Regular Rings—You'll find them a big help and a great economy.

BOTH NATIONAL REGULAR AND EXTRA LONG RINGS ARE PACKED IN THE HANDY FIVE CLUSTER

NATIONAL ZINC CABLE CLIPS





Through the use of National smooth galvanized flat surface cable rings ring cutting has been greatly minimized; in fact, very little is found except close to the poles. You can now do away with it even there by replacing the two rings on each side of the pole with National Zinc Cable Clips.

The flat, broad, smooth zinc strap of the National Cable Clip provides a wide surface for the cable to rest on and the hooks are so constructed that they move on the strand allowing the necessary play as the cable vibrates.

Send for complete information on National Rings and Clips

THE NATIONAL TELEPHONE SUPPLY COMPANY

5100 Superior Ave. Cleveland, Ohio

THE RING WITH THE TENSION GRIP

Activities of Commissions and Courts

FCC Makes Revisions in Tariff Circular No. 1

The Federal Communications Commission, on July 31, adopted order No. 12-A making certain revisions in tariff circular No. 1, which was issued April 3. An informal conference on it was held with representatives of carriers and state commissions, on June 6. The effective date of the circular remains as originally published, September 1, but the posting requirements are made effective January 1, 1936.

In its statement of exceptions, filed May 27 with the FCC, the United States Independent Telephone Association expressed the opinion that the tariff circular is too complicated for application to the small telephone companies and asked for the elucidation of certain points taken up in the circular.

It suggested the requirement of the use of sheets 8½ by 11 ins. in size, instead of 8 by 11, and the use of certain pre-determined letters in place of symbols to facilitate the use of the typewriter in the preparation of filings.

• • •

A. T. & T.'s Experimental Picture Service

The American Telephone & Telegraph Co. on August 7 started an experimental message toll telephone service for transmission of pictures to newspapers over machines provided by the papers.

The equipment used, the notice said, will be of a type approved by the telephone company and of a character that will not interfere with telephone or telegraph messages.

The company recently notified the Federal Communications Commission of the proposed service, to be tried for one year. It will be confined to the United States. The various Bell System companies have also filed schedules with the FCC, covering rates and regulations applicable to telephotograph equipment provided by the press under message toll telephone service.

• • •

Louisiana Rate Case Returned to Commission

Resumed hearings in Baton Rouge, La., on August 8 and 9 before Judge W. Carruth Jones in the Southern Bell Telephone & Telegraph Co. rate reduction suit in East Baton Rouge District Court, brought forth new testimony of technical nature relating to property valuations, as presented by company witnesses. The Louisiana Public Service Commission through its counsel, Huey P. Long, claimed the privilege of 15 days to decide whether to revise or stand by its reduction order, in the light of this new evidence presented in court but not submitted during its inquiry.

Upon conclusion of the testimony before Judge Jones on its merits, the case went back to the commission to permit study of the court transcript and possible amendment of the commission's order reducing the Southern Bell company's rates. The company is seeking to have set aside as unconstitutional the commission's order which slashed company revenues more than $600,000 a year by reductions ranging up to 25 per cent on local exchanges. The lower rates are now in effect.

After expiration of the 15-day period allowed the commission for scrutiny of the court testimony after the transcript is delivered, a date will be set by the court for oral argument in the suit.

The company claims the reductions unreasonably reduce its earnings and are confiscatory. The commission contends the company rates its investment too high.

• • •

Michigan Bell Brief Denies Saturation Reached

Inability to slash depreciation reserve and at the same time adequately provide for future increased demands for telephone service are claimed by the Michigan Bell Telephone Co., in a brief filed with the Michigan Public Utilities Commission contending that present rates fail to yield a satisfactory return.

The brief is a summary of the 17-year-old controversy, which has had almost annual innings before the commission, exhaustive examinations in federal court, and which is now back before the commission with an early order in prospect.

Recently engineers of the commission urged that the saturation point in telephone service is near in Michigan and that depreciation reserve and rates should be reduced accordingly.

Based on testimony of Dr. Frank B. Jewett, president of the Bell Labora-

Framing and Staining Service available with P & H PROCESS Poles

P&H

PAGE AND HILL CO. Minneapolis, Minn. *"Still in the Lead"*

CEDAR IS THE NATURAL POLE WOOD

tories, the answering brief contends that developments and refinements in service and continuous Michigan growth will impose far heavier future loads on the company.

Dr. Jewett told the commission of many developments and refinements that even now are being tested, but which have not yet been given the public and which represent definite advancements in telephony. These developments, Dr. Jewett added, naturally lead to many more.

The commission engineers also attempted to compare the company's rate of return with the depression years' return made by 41 industrial firms, but the brief holds that such comparison is unfair when made for poor business years only. Those firms, it has been testified, averaged a return of 5.247 per cent in 1934. Their average return for 1928, however, was 13 per cent.

Professor Riggs of the University of Michigan, called upon to testify for the commission, had said that the telephone company should be permitted to make a return of 6 per cent under present conditions. The brief shows that the company's return on the fair value of its properties in 1934 was only 2.7 per cent, which increased slightly to 3.22 per cent the first quarter of 1935.

The fact that the telephone company is not permitted, during good years, to earn a return comparable to that earned in other lines, is held in the brief to be good reason why its return should not be reduced during poor years further than the reduction suffered through loss of customers.

The Wagner appraisal, made for the commission in 1931 and brought up to 1934, which was not introduced into the case until the recent hearings, substantiated the company's conclusions as to the cost of reconstruction of the physical items of the telephone plant, the brief points out.

The company has contended that present rates are constitutionally inadequate to permit of earning a fair return on the fair value of its properties, and the brief maintains that stand.

• • •

Subscriber List Declines: Commission Cuts Rate

A 43 per cent decrease in the subscriber list of the Fremont Telephone Co., of Fremont, Wis., (from 183 to 98 stations) and the resulting decrease in the value of the service to the remaining subscribers, was held, by the Wisconsin Public Service Commission, to justify a decrease in rates. In an order handed down July 15 in the case of Herbert Fink, et al vs. the Fremont Telephone Co., the commission, accordingly, ordered the company's net monthly rate for party line rural resi-

The Exchange Building of the Fort Dodge Telephone Company, Fort Dodge, Iowa

PAY STATIONS IN FORT DODGE, IOWA, EARN $439.40 EVERY MONTH

Read the following details about Gray Telephone Pay Station earnings in the Fort Dodge, Iowa, territory. A letter received from Mr. T. J. Griffith, Superintendent of the Fort Dodge Telephone Company, is printed below.

July 23, 1935.

We have been using telephone pay stations for the past thirty years and find that they have been a very profitable investment. At the present time we have in service thirty 3-coin and twenty-seven single coin prepay stations. For the past six months the thirty 3-coin stations have produced an average monthly income of $344.86 and the twenty-seven single-coin stations an average monthly income of $94.54.

The location and average monthly income of the highest yielding stations are as follows:

Type	Location	Average Mthly Income
3-coin	Hotel	$51.26
,,	Railroad	17.76
,,	Hospital	17.15
,,	Y. M. C. A.	10.25
,,	Gasoline Flg. Sta.	6.76
Single coin	Restaurant	12.61
,,	Beer Garden	7.50
,,	Cigar Store	6.27

If any other information is needed, we will be glad to furnish you with it if possible.

Yours very truly,

T. J. GRIFFITH,
Superintendent.

GRAY TELEPHONE PAY STATIONS

GRAY TELEPHONE PAY STATION CO.

HARTFORD, CONN.

Order Direct or Through

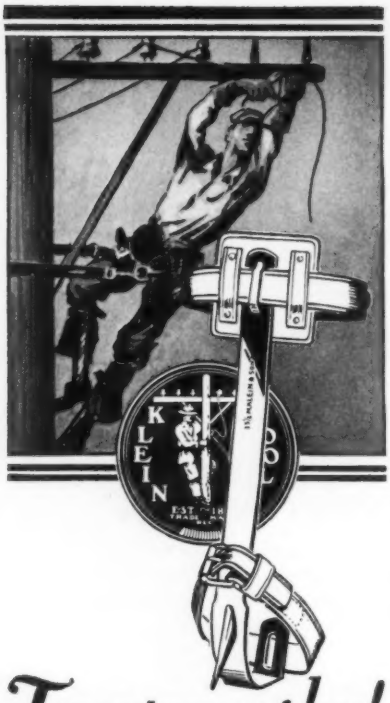
AMERICAN AUTOMATIC ELECTRIC SALES CO., Chicago

GRAYBAR ELECTRIC CO., INC., New York, N. Y.

KELLOGG SWITCHBOARD & SUPPLY CO., Chicago

STROMBERG-CARLSON TELEPHONE MFG. CO., Rochester

Or any other telephone supply house



Trustworthy!

KLEINS

Swinging back, trusting life and limb to a strap of leather, a gaff of steel—it's good to *know* that your equipment won't fail—it's good to realize that it carries the Klein trade-mark. Where competitive conditions have tempted many manufacturers to shave costs at the expense of quality, the House of Klein has gone steadfastly ahead, making tools and equipment in that same careful, trustworthy way that has characterized all Klein products, "since 1857."

Foreign Distributor: International Standard Electric Corp., New York

Distributed through jobbers

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want.

- ☐ Safety for the Pole Climber.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ The Safety Factor on Linemen's Leather Goods.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill. U.S.A.

3200 Belmont Avenue, Chicago, Illinois

dence service decreased from $2 to $1.50. It also ordered the discontinuance of the present rural zones and rates.

The petition for inter-connection, without toll charge, with subscribers of the Weyauwega Telephone Co. was denied by the commission.

The commission found and determined that a reasonable value of the property for rate-making purposes, including working capital, will not exceed $10,000. It held the company's book value of $21,336 should not be used as a basis for determining rates at the present time. It consists largely of property at 1927, 1928 and 1929 prices, which are in excess of prevailing prices, and includes a considerable amount of not used and useful property, the commission stated.

The books of the company were found to be unreliable prior to 1926. The commission was of the opinion that the company's 1934 depreciation accrual, namely, $12,007, was excessive and should be adjusted. Excerpts from the commission's findings follow:

"After careful consideration of the past history of the company, it is our opinion that a rate of 3 per cent is reasonable. There are certain factors which we believe justify this rate. The company's present status indicates that for some time in the future obsolescence and inadequacy will not be as important factors in depreciation as in the past. As is the case with practically all small telephone companies, piecemeal replacements are usually charged directly to expense as incurred. This practice should obviously be reflected in a lower depreciation rate.

Another factor which we believe is important in considering the value of service is the number of prospective subscribers in the area served by the company. One of the complainants, who appeared to be very familiar with the area in which the company serves, testified that there were approximately 183 rural homes in this area. We understood that many of these homes have been abandoned and may never be occupied again.

Another important question, in our opinion, is how can continued service in the entire area be safeguarded? The tremendous loss of subscribers since 1928 has created a serious situation. According to the company it has approximately 11 rural lines with 40 subscribers who are scattered over 59 miles of circuit. Many of these lines extend from 9 to 10 miles.

Since the company as a utility is in duty bound to maintain its plant in good, serviceable condition as long as there are any subscribers on the lines who demand service, the cost of maintenance will prove especially burdensome unless more subscribers are soon added. Many of the former rural subscribers have indicated their willingness to re-connect if the rates were reduced. In view of the fact that most of the costs of furnishing service are fixed costs, it is apparent that if reconnections were made the per subscriber cost of rural service to the company would be reduced.

The above considerations indicate that the present rates exceed the value of the service, unless new subscribers are obtained thus enabling continued service."

• • •

Direct Radio Telephone Service to Paris Proposed

Authority to establish a direct radio telephone service to Paris, France, is sought in an application filed with the Federal Communications Commission on August 12 by the American Telephone & Telegraph Co. It is proposed that the direct circuit be operated eight hours a day at the start. At all other times calls would be routed by way of London, England, as at present, it was explained by T. G. Miller, vice-president of the A. T. & T. Co.

Mr. Miller said that the plan had been outlined to the British and French governments, which have not as yet concurred in the proposal. The establishment of the service, he said, would await construction and installation by the French Telephone Administration of necessary equipment, a task requiring six months' time or more.

France requested the American government some time ago to aid in bringing about such a change in transatlantic telephone service (TELEPHONY of July 27, page 28).

• • •

Sentenced for Fraudulent Use of Telephone Slugs

Fred Williams, alias Campbell, 42, "turf attorney," was sentenced to the Cincinnati, Ohio, workhouse for 30 days and fined $50 and costs by Municipal Judge George E. Tebbs for defrauding the Cincinnati & Suburban Bell Telephone Co. by using slugs the size of a quarter in making long distance calls from pay stations.

• • •

Commission Rulings and Schedule of Hearings

FEDERAL COMMUNICATIONS COMMISSION. WASHINGTON, D. C.

July 29: Oregon-Washington Telephone Co., Hood River, Ore., filed telephone tariff, revised page to FCC No. 3, effective July 20. Announces rates applicable to semi-public coin box and public pay station service for the suburban rate area.

July 29: Platte Valley Telephone Corp., Scottsbluff, Neb., filed telephone tariff FCC No. 2, canceling FCC No. 1.

COMING CONVENTIONS

United States Independent Telephone Association, Tower Room, Stevens Hotel, Chicago, October 8, 9, 10 and 11.

Independent Pioneer Telephone Association of the United States, Stevens Hotel, Chicago, October 10; Annual Luncheon.

The Illinois Telephone Association, Hotel Pere Marquette, Peoria, November 14 and 15.

effective August 1. States that pursuant to special permission granted by the commission on July 8, 1935, the period for night station-to-station service has been changed from 8:30 p. m.-4:30 a. m. to 7:00 p. m.-4:30 a. m., canceling the evening rates applicable between 7:00 p. m.-8:30 p. m. This change results in a reduction in charges for service between 7:00 p. m. and 8:30 p. m.

July 29: Detroit & Cleveland Navigation Co. filed telephone tariff FCC No. 2, canceling FCC No. 1, effective August 1. States that pursuant to special permission granted by the commission on June 20, 1935, rates have been published applicable to wireless telephone service between the steamer "Greater Detroit" and the land station of the Lorain County Radio Corp., Lorain, Ohio.

July 29: Pacific Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 1. Announces that, effective August 6, Eldon Service Camp will be established as a telephone rate center. Announces that, effective September 1, Patton, Calif., will be served by the rate center Highland, Calif., only, instead of rate centers Highland and San Bernardino, Calif.; also announces a change in rates for Stafford, Ore., a telephone toll station on the lines of the West Coast Telephone Co.

July 30: Pacific Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 1. Announces that, effective August 9, 1935, Belfair Garage, Belfair Lumber and Calders Cabin Resort, Wash., will be established as telephone rate centers.

July 30: Bell Telephone Co. of Pennsylvania filed telephone tariff, revised pages to FCC No. 2. Announces joint other line rates applicable to message toll telephone service between the telephone company and watercraft plying in the Delaware and Schuylkill Rivers through the station of the Atlantic Communications Corp. at Philadelphia, Pa., effective September 1.

July 31: American Telephone & Telegraph Co. filed telephone tariff, revised page to FCC No. 4. States that rules and regulations have been published applicable to telephotograph equipment provided by the press under message toll telephone service, which will be permitted on an experimental basis for one year, effective August 7.

The same notification was also filed by the various associate companies in the Bell System.

July 31: Order No. 12-A, making certain revisions in tariff circular No. 1, adopted. The effective date of the circular remains as originally published, September 1, 1935, but the posting requirements are made effective January 1, 1936.

August 1: Indiana Bell Telephone Co. filed telephone tariff, revised pages to FCC No. 1, effective August 5. The revised pages announcing rates from certain points in Indiana to Eastview, Ky., and changes in the spelling of certain stations in Kentucky were filed on less than five days' notice; therefore, they were rejected by the commission.

August 1: Indiana Bell Telephone Co. filed telephone tariff, revised pages to FCC No. 1, effective August 5. Announces rates from certain points in Indiana to Eastview, Ky., a newly-established rate center, and changes in the text of certain telephone toll stations in Kentucky.

August 2: Postal Telegraph-Cable Co. filed telephone tariff, supplemental No. 3 to FCC No. 8, effective September 3. Announces long distance telephone rates between Chicago, Ill., and St. Joseph, Mo.

August 2: American Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 4, effective September 1. Announces that overseas telephone service to the S. S. Leviathan will be discontinued. Also announces the "Other Line" rate to vessels plying the Delaware and Schuylkill rivers near Philadelphia, Pa., reached through the Bell Telephone Co. of Pennsylvania and the Atlantic Communications Corp.

August 5: Chesapeake & Potomac Telephone Co. of Virginia filed telephone tariff, revised pages to FCC No. 2, effective August 10. States that rates have been published for service from certain points in Virginia to Upper Track and Meadow Bridge, W. Va., new rate centers. Also block designations for certain rate centers in Virginia have been published.

August 5: Chesapeake & Potomac Telephone Co. of West Virginia filed telephone tariff, revised pages to FCC No. 2, effective August 10. States that rates have been published for service from Upper Track and Meadow Bridge, W. Va., new rate centers, to certain points in Virginia. Also the block designations for certain rate centers in West Virginia have been published.

August 5: The Mountain States Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 2. Announces that, effective August 9, Two Gray Hills, N. M., Teec-Nos-Pos, Ariz., Aneth, Utah, Pole Mountain Nursery, Wyo., Storz Ranch, Colo., and Little Beaver Well., Mont., will be established as rate centers, and that the name of toll rate center, Sand Springs, Colo., will be changed to Wileys Resort. Also announces that, effective September 5, Victor-Jackson Stage, Wyo., will be discontinued as a toll rate center and the rates between that point and certain points in Idaho will be discontinued.

August 5: Ohio Bell Telephone Co. filed telephone tariff, revised page to FCC No. 2, effective September 6. Announces that Glenwood, Ohio, will be discontinued as a rate center, and rates from that point to certain points in West Virginia will be discontinued.

August 5: The Pacific Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 1. Announces that, effective August 13, Flynn Ranch, Larson, North Star, Calif., and Walville, Wash., will be established as toll rate centers, and that Halfway Auto Camp, Montgomery, Rainbow and Stock-

STRONG, EVEN TALKING CURRENT

- Replace every two old round No. 6's you remove with one TWIN-SIX 3-Volt Telephone Battery. The TWIN-SIX has 12½% more zinc surface than two No. 6's and will give your subscribers a strong, EVEN talking current.
- You improve your service and save time and money when you replace with the TWIN-SIX. You make two connections instead of four, handle 40% less weight and 30% less bulk—one compact square battery instead of two bulky round ones!
- Order 30 or more TWIN-SIX Batteries and they will be shipped F.O.B. your Exchange. Price is only 39¢ each (47¢ west of the Rockies). Order from Inland Equipment Co.

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INLAND EQUIPMENT CO., (Distributors)
MAX F. HOSEA, President, INDIANAPOLIS, IND.

"Telephony's" Engineering Data

By B. C. Burden

If the ring cut is nothing more than a scratch and exists in cable which has been in place a long time, the cable may safely be considered in little danger of immediate injury. However, if the sheath has been worn to approximately one-sixth of its thickness and is accompanied by the abrasive action characteristic of ring cutting, the cable should be re-examined from time to time. If definite signs of further

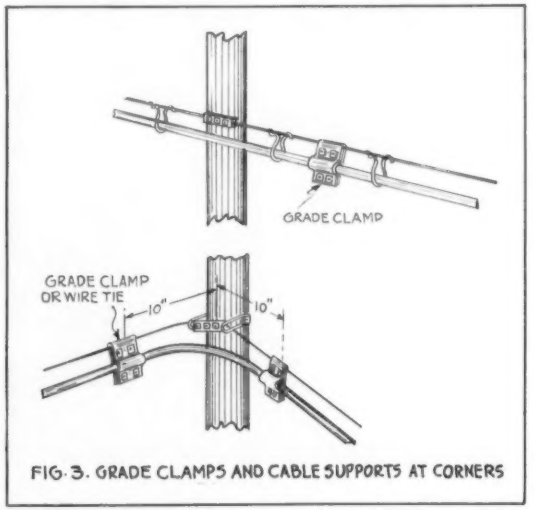


FIG. 3. GRADE CLAMPS AND CABLE SUPPORTS AT CORNERS

penetration or cutting are found, preventive methods should be applied.

To protect cable from ring wear wherever this condition is discovered, first determine just what is placing the strain

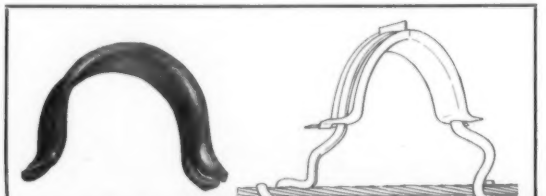


FIG. 4.—USE OF RING SADDLES PREVENTS RING CUTTING NEAR POLES.

"Telephony's" Engineering Data

By B. C. Burden

on the cable. If the damage occurs on a grade or at a corner, place a grade clamp at the point where the grade begins and throughout its length, as shown in Fig. 3.

Where the old wire type rings are used in locations where excessive cutting or wear occurs, these rings should be replaced with late type rings. If conditions warrant, aluminum saddles, shown in Fig. 4, should be placed on the rings on each side of the pole. The new rings should be placed so as not to rest on the worn places in the sheath.

Large cable which, due to faulty construction, excessive sag, etc., may be putting considerable strain on the rings near the pole, may require the placing of additional or extra rings to help support the cable at such points. Where possible, the cause of the excessive strain should be corrected.

A new type of ring designed to prevent ring cutting or excessive wear at the pole is shown in Fig. 5. This ring or support consists of a zinc strap which is attached to the supporting strand as shown and is so designed that it moves with the cable, thus preventing wear.

When ring cutting is found to extend out into the span for more than two or three rings, it will generally be found desirable to replace all of the old type rings (if this is what is causing the trouble) with the latest type rings.

All damage to the cable sheath should be repaired at the time the rings are changed or when conditions bringing about the trouble are corrected. Worn or cut sheath should be soldered over by a splicer. Exceptionally bad sections of

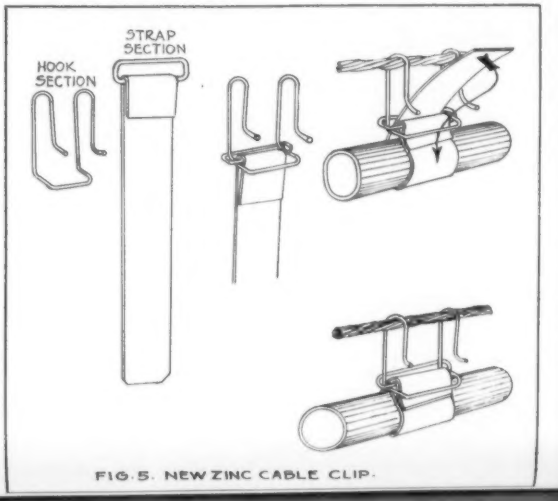


FIG. 5. NEW ZINC CABLE CLIP.

"Telephony's" Engineering Data

By B. C. Burden

cable may require complete replacement. Old cable plant which is badly worn can be continued in service for several years by the use of ordinary friction tape repairs in badly cut sections of cable.

The Effect of Trees on Cable Sheath Damage

One of the most prolific sources of cable sheath damage is the indirect effect of trees which are in contact with either poles, the cable, or the supporting strand. The large exposed area of the average tree and its continued movement, even in light winds, will in a comparatively short time render new cable worthless, if tree limbs are allowed to come in contact with the cable lead.

There are two schools of thought on the subject of protecting cable from being damaged by trees. One believes that all cable which passes through trees should be protected by wooden molding, thus avoiding the necessity for any tree trimming. The other contends that trees should be trimmed and adequate clearance maintained, and that wood molding should be used only where tree trimming privileges cannot be obtained.

The writer is in accord with this latter theory as the use of wood molding, if applied to cable sheath wherever trees are involved, will in many plants result in excessive costs.

Equally bad with the excessive plant costs is the fact that unless trees are periodically trimmed, regardless of whether or not wood molding is used, the lead will eventually become completely enveloped in a growth of trees so that it would be extremely difficult to rebuild the lead or to carry on replacement work. The effect on the property owner of not trimming trees periodically would be to discourage his granting the tree trimming privileges.

Tree trimming along cable leads need not be extensive each year but should be a persistent effort. The plant manager who is on the job will generally get over his cable plant once each year and will combine tree trimming with a general inspection and repair of the cable sheath.

Preventive Measures in Cable Construction

Much of the damage from ring cutting may be avoided if the construction forces will give due thought to the matter of proper sag, the use of grade clamps, proper support of sleeves, the use of adequate supports at corners, proper tree clearance, poles firmly tamped in the ground, etc.

The use of zinc cable clips of the type illustrated in Fig. 5 may result in improved results and greater freedom from ring cutting damage. On new work, where cable is being pulled in and where it is desired to use the zinc cable clips for supporting the cable near the poles, it is necessary to place the regular ring to facilitate pulling in the cable, after which the first two rings on each side of the pole are removed and the zinc cable clips substituted.

These clips are so designed that the broad, smooth surface of the zinc strap will prevent damage to the sheath while the supporting hooks are so constructed as to give

ade, Ore., have been changed to seasonal telephone toll stations. Also announces that, effective August 15, Bell Loffland Kettleman, El Monte Park, Dye Kettleman, Lakeside, Rocca, Calif., Leona, Ore., and Orchard (Chelan Co.), Wash., will be established as telephone toll stations.

August 5: Commission rejected telephone tariff, revised pages to FCC No. 2, effective August 9, filed by Mountain States Telephone & Telegraph Co. The revised pages announcing new toll rate centers, and a change in name of a rate center, were filed on less than the required five days' notice; therefore they were rejected by the commission as being unlawful.

August 6: Pacific Telephone & Telegraph Co. filed telephone tariff, revised pages to FCC No. 1. Announces that, effective August 16, Coldbrook C.C.C. Camp F-370, San Gabriel Canyon No. 18, Dr. James B. Oliver, E. M. Schofield, Calif., and Hayes, Ore., will be established as telephone toll stations. Also announces that, effective September 10, Hammond, Ore., will be served from Warrenton, Ore., in addition to the toll station at this point, and that the telephone toll station Jenny Creek Guard Station, Ore., will be discontinued.

August 12: Application filed by American Telephone & Telegraph Co. for authority to establish a direct radio telephone service to Paris, France. It is proposed that this circuit shall be operated at first for eight hours a day. At all other times calls would be routed via London, England, as at present. Plan outlined to British and French governments, which have not as yet concurred.

ARKANSAS

July 31: A certificate of necessity and convenience issued to F. W. Kellogg of Harrison, authorizing him to build a telephone system at Lead Hill, Boone county, and to construct a toll line from Harrison to Lead Hill.

August 12: Hearing on appeal from action of city council of Bentonville in ordering reduction of rates of Southwestern Bell Telephone Co. The ordinance passed by the city council reduced rates in Bentonville as follows: Business, from $3.75 to $3 a month; one-party residence from $2.50 to $2; two-party residence, from $2 to $1.50.

ILLINOIS

August 1: Illinois Consolidated Telephone Co. filed a change in its rates for telephone service including toll messages applicable to its intrastate service in the state of Illinois. The change consists in increasing all such charges for service, except service rendered from public pay stations, by 3 per cent. This is the amount of tax imposed on public utilities by the public utility tax act which became effective July 1. Should this advance in rates be granted, the company nevertheless must absorb a tax on the advance, tax on messages originating at public pay stations and additional accounting expense in a substantial amount.

August 3: The Illinois Southeastern Telephone Co. filed a change in its rates for telephone service including toll messages applicable to its intrastate service in the state of Illinois. The change consists in increasing all such charges for service except service rendered from public pay stations, by 3 per cent. The increase in rates is necessary because an act of the Illinois legislature which became effective July 1, and requires telephone companies to pay to the state of Illinois 3 per cent of their gross receipts for the transmission of telephone messages, to be used solely for unemployment relief.

INDIANA

July 24: Petition filed by city officials of South Bend asking for reduction in rates of the Indiana Bell Telephone Co. in that city, alleging that local rates are higher than those charged elsewhere by the Bell company in cities of similar size and character.

MISSOURI

August 8: Approval granted application of the Southeast Missouri Telephone Co. to file rate sheet for telephone service at Dexter, Stoddard county.

NEBRASKA.

August 5: Application filed by Chester Telephone Co. for authority to issue $10,000 of stock to purchase existing exchange.

August 5: Application filed by Cozad Mutual Telephone Co. for authority to establish uniform discount rate of 25 cents a month and to eliminate old discount rate of 75 cents to rural subscribers.

NEW YORK.

August 14: Continued hearing in New York before Commissioner Brewster in the commission's investigation of the rates of the New York Telephone Co.

OHIO.

August 8: Permission granted the Ohio Bell Telephone Co. to use its lines for the transmission of photographs to newspapers. The commission approved a schedule providing for the use, by the press, of message toll telephone service on an experimental basis for one year for the transmission and reception of pictures for publication by means of tele-photographic equipment provided by the press. Service will be furnished at the rate applicable to usual toll messages, it was stated.

WISCONSIN

July 15: The commission ordered the net monthly rate of the Fremont (Wis.) Telephone Co. for party line rural residence service decreased from $2 to $1.50, finding its justification in a 43 per cent loss in stations and the resultant decrease in the value of the service to the remaining subscribers. It also ordered the discontinuance of the present rural zones and rates. The commission, however, denied the petition of the company's subscribers for inter-connection, without toll charge, with subscribers of the Weyauwega Telephone Co.

July 24: Complaint dismissed of the Annaton-Pretson Telephone Co., that the Iowa County Telephone Co. had invaded the former's terriotry in extending service to the Albert Reeves' farm near Montfort. The commission found that the Reeves' farm was well within the district served by the Iowa County utility.

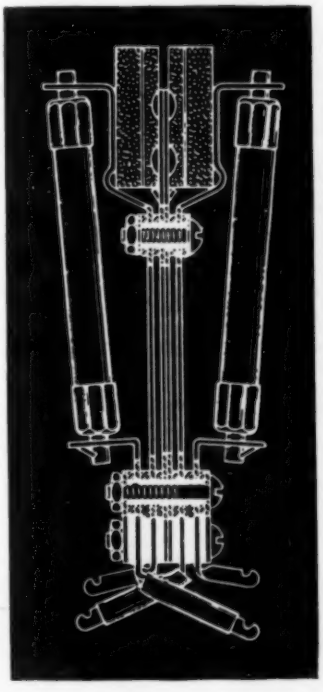
July 26: The commission ordered the service connection charges of the Commonwealth Telephone Co., of Madison, to 93 patrons of the Montpelier Telephone Co. reduced from $9 to $6 per year.

FIG. 5. NEW ZINC CABLE CLIP.

FIG. 4.—USE OF RING SADDLES PREVENTS RING CUTTING NEAR POLES.

COOK

H-36



Central Office Protectors

This protector is for use in exchanges in rural sections where the distribution of light and power circuits do not form a sufficient hazard to demand heat coil protection.

This H-36 is simple, inexpensive, well built and widely used.

COOK ELECTRIC CO.
CHICAGO

Condensed Telephone News

Telephones

FORT WAYNE, IND.—A decided increase in telephone installations in this city is reported by the Home Telephone & Telegraph Co. A total of 1,706 installations were made during the first six months of this year.

NEW YORK, N. Y.—The Bell System in July lost 22,800 stations, compared with a loss of 33,500 in July, 1934.

The New York Telephone Co. during July lost 14,486 stations, compared with a loss of 14,975 stations in July, 1934, and a loss of 20,402 stations in July, 1933.

COLUMBUS, OHIO—O. N. Olsen, district commercial manager for the Ohio Bell Telephone Co., reports that during the first six months of this year the company in Columbus made the highest record in telephone connections for a like period since in 1931.

The number of telephones installed in Columbus during that period was 6,098, compared with 4,684 disconnections, showing a net gain of 1,414 stations. The net gain was larger than for the corresponding period last year, when an increase of 1,144 was recorded, the first net gain at that time since 1930.

During June the number of connections for the month was the highest for that period since 1930, with a total of 1,058 stations. The month ended with a net loss of but 82 stations, which compares with a loss of 210 in June of last year, 559 during the same period in 1933, and 1,163 in 1932.

PHILADELPHIA, PA.—The Bell Telephone Co. of Pennsylvania reports a net loss of 2,928 telephone stations in June, against a loss of 3,824 in June of last year. For the six months there was a net gain of 9,455 stations, against a net gain of 6,330 stations in like period of 1934.

Miscellaneous

SPENCER, IND.—Work has been started on changing the Indiana Bell Telephone Co.'s system here from magneto to common battery operation. The offices of the company have been remodeled.

CORYDON, IOWA.—The telephone dispute over ownership of the free line between here and Allerton will be taken to the Iowa Supreme Court. A motion for a new trial was denied recently by District Judge Homer A. Fuller. Attorneys for the Middle States Utilities Co. immediately appealed. The Middle States Utilities Co. and the Incorporated Telephone Co. of Allerton have been fighting over the line since 1930.

BROOKSVILLE, KY.—The Northern Kentucky Telephone Co., operating in Augusta, Germantown, Mt. Olivet and certain sections of Bracken and Robertson counties, has been sold. Master Commissioner Millard Byrne conducted the sale at the court house door on July 12. Douglas Newell, representing the State Trust Co., trustees, plaintiff in the suit, bid in the property at $30,000.

WEST LIBERTY, IOWA.—Agreement between the rural telephone patrons and the West Liberty Telephone Co. has been reached and until the first of the year the same rates which have been in effect the last two years, instead of the higher rate demanded by the local company, will continue.

In the meantime an expert auditor will be engaged to examine the books of the company to determine if a higher rate is justifiable.

STAUNTON, VA.—The Augusta County Farmers' Mutual Telephone Co. closed its exchange here at midnight, July 31. A few of its 106 subscribers made other arrangements for continued service. Approximately 40 subscribers in the county have signed up for service through the Chesapeake & Potomac Co.'s central station here. Some have petitioned the New Hope switchboard for service.

Recently the stockholders of the mutual company—one of the last of the smaller Independent units in Virginia to bow to the inroads of "big business" competition—voted to close their switchboard at midnight July 31, because of decreased patronage and mounting debt.

"For the time being we are going to hold on to our charter," C. V. Parkins, president of the mutual company, said.

Obituary

SPENCER, IND.—Robert S. McDonald, 68 years old, for many years manager of the Indiana Bell Telephone Co.'s exchange here, died recently at his home in Indianapolis. He suffered a heart attack while sitting at the dinner table.

WHITEWATER, KANS.—L. H. Bowers, for the past 20 months district manager of the Kansas Telephone Co. here, succumbed to a heart attack sometime ago. Mr. Bowers was born in Hamilton, Ohio, July 17, 1883, and had made that state his home most of his life. He had been associated with telephone work since he was 17 years old. Before going to Whitewater, with the Kansas Telephone Co. he had been Ohio state manager for the Ohio Associated Telephone Co. at Marion, Ohio.

MARTINS FERRY, OHIO—John Hall, lineman for the Cadiz Community Telephone Co., died five minutes after reaching a local hospital from injuries received when a telephone pole he was working on fell to the ground at Titonville.

HELENA, MO.—Thomas Rogers, age 65, manager of the local exchange of the Andrew County Mutual Telephone Co., was killed on July 11 and his wife was injured, in an automobile accident which occurred while they were returning home from Maysville. Mr. Rogers died at Clarksdale as he and Mrs. Rogers were being taken to a hospital in St. Joseph. Besides his widow he is survived by a son, Roy Rogers. He had been with the telephone exchange for 25 years.

CENTERVILLE, WIS.—Ernst M. Klessig, 70, one of the founders of the former Mosel-Centerville Telephone Co., died at his farm home in Centerville on July 30.

In addition to being an organizer and stockholder of the telephone company, which he headed for 25 years, Mr. Klessig was Centerville assessor from 1911 to 1915 and a member of the school board for years. He was a trustee of the Lutheran congregation when a new church was erected at Cleveland.

He is survived by his widow, four sons, four daughters and 15 grandchildren.

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Buyer's Weekly Guide

A list of firms and companies offering equipment, supplies or services for operating telephone companies

ADDING MACHINES

Burroughs Adding Machine Company, Second Blvd., Detroit, Mich. — Adding, Bookkeeping, Calculating, Billing and Accounting Machines, Electric Carriage Typewriters, Standard Typewriters, Operator Correct-Posture Chairs. Burroughs machines are in use today in hundreds of progressive telephone companies throughout the country.

BATTERIES—DRY CELLS

Burgess Battery Co., Freeport, Ill.—Burgess Flashlights and Uni-Cel Flashlight Batteries—for dependability and service. The Burgess Twin-Six Telephone Battery—a 3-volt unit designed to replace two No. 6 cells, with longer life, lighter weight, smaller size and a leakproof case. The Burgess Little-Six—replaces the old type No. 6 cell, is smaller and lighter, will not ooze or bulge, has all the electrical capacity of the standard No. 6 cell.

National Carbon Company, 30 E. 42nd St., New York.—"Columbia" Telephone Dry Batteries; "Eveready" Flashlights, Flashlight Batteries and Long Life Dry Cells, "National Pyramid" brushes, carbon, graphite and metal graphite for motors, generators and rotary converters. "Eveready" Prestone anti-freeze; "Eveready" Rustone rust preventive; and "Eveready" Air Cell telephone operators' transmitter batteries.

Ray-O-Vac Company, Madison, Wis.—Ray-O-Vac telephone batteries — longer life and better service proven by tests in accordance with U. S. Government standards and records of users. Ray-O-Vac flashlights and industrial flashlight batteries are other items showing Ray-O-Vac's outstanding quality.

BATTERIES—STORAGE

The Electric Storage Battery Company, Allegheny Ave. and 19th St., Philadelphia, Pa.—Exide Storage Batteries. Branches: Boston, New York, Rochester, Philadelphia, Pittsburgh, Washington, Atlanta, Cincinnati, Cleveland, Detroit, Chicago, Kansas City, Minneapolis, St. Louis, Denver, San Francisco and Seattle.

BATTERY CHARGING EQUIPMENT

General Electric Company, Bridgeport, Conn.—Tungar battery chargers. G-E pole line hardware. Cable filling compound.

CABLE—LEAD ENCASED

American Electrical Works, Phillipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper wire. Chicago Office: 20 N. Wacker Drive; Cincinnati: Traction Bldg.; New York: 100 E. 42nd St.

British Insulated Cables, Ltd., Surrey House, Embankment, W. C. 2, Factory: Prescot, Lancashire, England.—Telephone cable of all sizes and capacities.

General Cable Corporation, 420 Lexington Ave., New York, N. Y.—Paper telephone cables of standardized manufacture for over forty years. Weatherproof and insulated copperweld drop wire.

Eugene F. Phillips Electrical Works, Ltd., Montreal, Can.—For any type of wire or cable used in telephone, telegraph or power work get in touch with "Phillips." Manufacturers of bare and insulated copper wires, rubber insulated wires, enameled wire, magnet wire, telephone cables, power cables, switchboard cables, flexible cords, copper rods, etc.

CABLE RINGS

National Telephone Supply Company, 5100 Superior Ave., Cleveland, Ohio.—National Cable Rings, National Splicing Sleeves, Non-Breakable Messenger Cable Hangers, Marlin and Swisher Cable Hangers and Custom Galvanizers. National cable rings are practical because they are two-way,—they allow the cable to be pulled in either direction. National sleeves make secure the weakest points in the line. If it's a splice—make it a National.

CABLE TERMINALS

Cook Electric Company, 2700 Southport Ave., Chicago, Ill.—Protective Pole Cable Terminals, Unprotected Pole Cable Terminals, central office protection, lighting arresters, sleeves, fuses.

Reliable Electric Company, 3145 Carroll Ave., Chicago, Ill.—Complete line of cable terminals, telephone and switchboard protectors, sleeves, fuses, solderless wire connectors and specialties.

CARBON DIAPHRAGMS

Noris Carbon Company, Inc., 160 5th Ave., New York, N. Y.—Carbon diaphragms, carbon back plates, granular and globular carbons, lightning arresters.

CONDUIT

Brazil Hollow Brick & Tile Company, Brazil, Ind.—Makers of Brazil Vitrified Tile. Conduit.

CORDS, CABLE AND WIRE

Lenz Electric Manufacturing Co., 1751 N. Western Ave., Chicago—Established 1904—telephone and switchboard cords for all makes of equipment, braided and lead-covered telephone cable, flame-proof jumper wire, interior telephone wire, switchboard wire.

CORDS AND WIRE

Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago—Telephone and Switchboard Cords, Flame-proof Jumper Wire, Switchboard Wire, Interior Telephone Wire. W. L. Runzel, President, has devoted over 40 years to the making of fine telephone cords.

ELAPSED TIME RECORDERS

Calculagraph Company, 50 Church St., New York, N. Y.—Calculagraph is the world's standard elapsed time recorder and gives you toll records printed with elapsed time to the second. Both spring driven and electric motor models are available.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Alfred E. Cowling, Scotstown, Quebec.—Eastern cedar poles, plain or butt treated.

International Creosoting and Construction Company, Galveston, Texas—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

Jordan Bros. Lumber Co., Box 84, Norfolk, Va.—Virginia White Cedar Poles. Plain or charred and creo-treated butts.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

Michigan Pole & Tie Company, Newberry and Grand Rapids, Mich. — "Poles with Character." Northern White and Western Red Cedar. Strategically located yards, Minneapolis, Minn., and Reed City (Lower Michigan), insure quick deliveries.

Naugle Pole & Tie Co., 5 South Wabash Ave., Chicago, Ill. Northern White and Western Red Cedar Poles. Plain or butt-treated. Let us quote you our new low prices.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada — Western Red Cedar Poles. Plain or Butt treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or Butt treated.

SUPPLIES, SWITCHBOARDS AND INSTRUMENTS

American Automatic Electric Sales Company, 1033 West Van Buren Street, Chicago, Ill.—Public Automatic Telephone Systems, Private Automatic Telephone Systems, Central Battery and Magneto Manual Telephone Switchboards, Remote Control Switchboards, Telephone Instruments of all types, Battery Eliminators, Charging Equipment, Signaling and Control Apparatus, Cords, Wires, Cables, Monotype Copperweld Drop Wire, and a complete line of construction materials and supplies.

Automatic Electric Company, 1033 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Telephones, relays, signalling and control equipment.

Automatic Electric Company, Ltd., Milton Road, Edge Lane, Liverpool, England.—Automatic Telephone Equipment.

Automatic Electric Sales Company, Ltd., 1027 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Manual Telephone Equipment, telephones, storage batteries, wire, cable, poles, etc.

Kellogg Switchboard & Supply Company, Adams & Aberdeen Sts., Chicago, Ill.—Engineers and designers, manufacturers and suppliers of complete equipment for telephone exchanges and communication systems. Manufacturers of "Master-built" Common Battery, Magneto and PBX Switchboards, "Masterphone" Telephone Instruments, and a complete line of telephone supplies, including bronze drop and interior wire.

North Electric Manufacturing Company, Galion, Ohio—Machine switching telephone systems. Automanual and Automatic. "All-Relay" Switching Apparatus (Dialless and Dial Control). Unattended Satellite Systems.

Siemens Brothers & Company, Ltd., Woolwich, England—Automatic and Manual Telephone Equipment.

Stromberg-Carlson Telephone Manufacturing Company, 100 Carlson Road, Rochester, N. Y. — Telephone apparatus of all kinds, switchboard cords, cable and general telephone supplies.

TOOLS

Crescent Tool Co., Jamestown, N. Y.—CRESTOLOY Pliers, Curved Needle Nose Pliers, Heavy Diagonal Cutting Pliers, Linemen's Side Cutting Pliers, End Cutting Nippers, Crescent Hack Saws.

CLASSIFIED SECTION

Rates 10 cents per word payable in advance. Minimum charge $2.00 for 20 words or less.

RECONSTRUCTED EQUIPMENT

Western Elec. No. 20 desk set with W. E. Transmitter and Receiver, complete with No. 240 3-bar 1000-1600 or 2500 ohm external post signal set @	$ 8.50
Kellogg No. 118 desk set with Kellogg Transmitter and Receiver, complete with W. E. No. 240 3-bar 1000-1600 or 2500 ohm ringer external post signal set @	8.25
Kellogg New Grabaphone with Western Elec. No. 240 3-bar 1000-1600 or 2500 ohm ringer external post signal set @	11.00
Leich Elec. Slip Type Receiver with new shell and cord @	1.10
Western Elec. No. 143 Receiver with repolished shell and new cord @	1.00
Dean Elec. Latest Pony type 5-bar 1600 ohm Bdg. compacts @	7.75
Stromberg-Carlson No. 896 5-bar 1600 ohm Bdg. compacts @	9.50
Western Elec. No. 329 Transmitters with Back and Mouthpieces @	1.10
Kellogg New Grabaphone, complete less signal set @	7.25
Stromberg-Carlson No. 104 4-bar 1000-1600 or 2500 ohm compacts @	6.90
Kellogg No. 41 slip type Receiver with new shell and cord @	1.25

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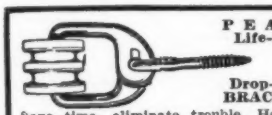

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With balanced coil. Locates shorts, crosses, grounds and wet spots; also tone circuit.

$49.00 Sent on trial.

STEWART BROS.
Ottawa, Ill.

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POSITION WANTED—Traffic or commercial, thoroughly familiar with latest engineering and operating methods. Dial or manual; single or multi-office; force adjustment and management. Address 8468, care of TELEPHONY.

POSITION WANTED—As manager, troubleman and operator. Am 29 years old—have had seven years' experience on both C. B. and Magneto Exchanges. Will go anywhere—wife an experienced operator. Best of references. Address 8458, care of TELEPHONY.

EXPERIENCED commercial and traffic man desires position with either Independent telephone company or equipment manufacturer. Am 29 years old and have had plant training. Prominent local and toll office, of which I was traffic chief, enjoyed service record. Best references. Address 8463, care of TELEPHONY.

ENGINEER and plant superintendent, eleven years Bell and Independent experience, university graduate, age 33, capable of handling plant and personnel problems in practical and progressive manner, desires position with greater opportunity for advancement. Address No. 8465, care of TELEPHONY.

POSITION WANTED—By all around telephone man with technical, engineering, managerial experience, Bell and Independent. Have ability to place telephone properties on better paying basis. Best references. Go any place. Address 8427, care of TELEPHONY.

OBITUARIES OF TELEPHONE MEN

(*Concluded from page 25*)

for a period of years associated with Thomas A. Edison in his laboratories and factories at Orange. For a time he also demonstrated phonographs, one of his jobs being to give concerts with the Edison talking machine to the wonderment of hundreds of audiences. While in the Edison employ he worked under Victor Emerson, whose name became famous in the phonograph world.

His knowledge of practical electricity won for Mr. Reading wide recognition and he was frequently called upon to solve problems in this field. Prior to his illness he had carried on an electrical repair business.

▲

COLONEL JOSEPH WILLIAM HOLLOWAY, president and manager of the Home Telephone Co. of Smithfield, Va., died the latter part of May at the age of 68 years. He had been in declining health for the past two years.

Col. Holloway had been president and manager of the telephone company for the past 35 years. In addition to his business, he took an active part in the political, religious and social life of Isle of Wight county.

He served several years as a steward of Trinity M. E. Church and as president of the Isle of Wight Sunday School Association. Although holding no public office, he wielded considerable influence in the political affairs of his country.

▲

EDWIN S. MILLS, for many years president of the West Newton (Ind.) Telephone Co., and a prominent business man of central Indiana, died recently at his home in that city at the age of 72. Mr. Mills was a member of the board of an Indianapolis life insurance company and was active in the establishment of the first life insurance company in West Newton. During his younger days he spent some years teaching school, upon graduating from Earlham College.

▲

CHARLES SELF, formerly local manager of the English, Ind., exchange of the Indiana Telephone Corp., passed away recently at his home north of that town. He was 63 years of age. His widow and two daughters survive him.

▲

JOSEPH C. HUNT, 56-year-old manager of the New Ross Co-operative Telephone Corp., New Ross, Ind., committed suicide on August 4 by inhaling carbon monoxide fumes from a tube attached to the exhaust pipe of his automobile. The act was attributed to despondency over ill health and business difficulties. Mr. Hunt is survived by two daughters.